



**The effects of the liberalisation of capital controls with respect to the inflow of foreign
direct investment in the mining industry in South Africa**

A Research Report
presented to

The Graduate School of Business
University of Cape Town

In partial fulfilment
of the requirements for the
MCOM in Development Finance Degree

by

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December 2013

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ii. Acknowledgement

I am grateful to my supervisors Dr. William Insaadoo and Professor Nicholas Biekpe for their guidance and supervision.

I am also very grateful to Mr Amon Magwiro who allowed me to utilise his E-views software and guided me in carrying out the quantitative analysis.

I am grateful to my friends and family who have supported me through this period.



iii. Abstract

South Africa has in the recent past endeavoured to attract foreign direct investment through the liberalisation of capital controls. The question that has been raised is whether, in the wake of the recent global financial crisis and the corresponding response of economists that now more than ever the re-introduction of capital controls is necessary, the liberalisation of capital controls in South Africa is necessary.

Therefore the study endeavours to investigate, taking cognisance of the peculiarity of the country, whether the liberalisation of capital controls in the form of exchange controls has had a positive effect in attracting foreign direct investment. Other determinants of foreign direct investment are considered to identify whether focus should perhaps be on these determinants to inform policies implemented to attract foreign direct investment.



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iv. Glossary of Terms and Abbreviations used in the Report

<i>Term</i>	<i>Definition/Full Form</i>
<i>ADF</i>	<i>Augmented Dickey-Fuller</i>
<i>AR</i>	<i>Auto-regression term</i>
<i>ECM</i>	<i>Error correction model</i>
<i>FDI</i>	<i>Foreign Direct Investment</i>
<i>GDP</i>	<i>Gross Domestic Product</i>
<i>GEAR</i>	<i>Growth, Employment and Redistribution</i>
<i>IMF</i>	<i>International Monetary Fund</i>
<i>JSE</i>	<i>Johannesburg Securities Exchange</i>
<i>NPV</i>	<i>Net Present Value</i>
<i>OECD</i>	<i>Organisation for Economic Co-operative and Development</i>
<i>UNCTAD</i>	<i>United Nations Conference on Trade and Development</i>



CHAPTER ONE

1.1 Introduction

Capital controls are measures that are put in place by governments to regulate flows of capital in and out of the country. These include taxes, tariffs, exchange rate controls, outright legislation and volume restrictions, as well as market-based forces. The study of capital controls has received much attention in the aftermath of financial crises witnessed in the 1990s (Asiedu and Lien, 2004). Economists and academicians have interrogated the effectiveness of controls on the regularisation of capital inflows and outflows. More specifically with respect to capital inflows, studies have endeavoured to interrogate whether capital controls have assisted countries affected by the financial crises, channel capital inflows to meaningful investments (Habermeier, Kokenyne and Baba (2011), Chanda (2005) and Neumann (2006). It is noteworthy that there is no consensus on the effectiveness of capital controls with respect to controlling how capital is invested. However, case studies on countries such as Chile have shown that controls have an impact on the volumes that flow into the country (Cordella, 2003).

The world has recently witnessed a financial crisis in the United States (US) that has had rippling effects on economies worldwide. The cause of the crisis is said to be the loss of confidence by US investors of the sub-prime mortgages (Nanto et al., 2009). Home owners who had taken sub-prime mortgages found it difficult to make payments. Due to the boom in the housing market, the value of the houses plummeted, which meant that the value of houses repossessed would not cover the defaulted mortgages (Nanto et al., 2009). This caused stock markets around the globe to collapse and the tightening of belts for fear of worse rippling effects (Nanto et al., 2009). What followed was the flight of capital from markets that were deemed risky; that is, emerging markets and developing countries and the deep of these economies (Nanto et al., 2009).

Questions have since been raised on whether these countries should consider the imposition of capital controls to shield their markets against the volatility of investments in their countries. It is therefore against this background that this study is deemed important citing the fact that South Africa is one such country that has had rickety capital flows (Rex and Nicolas, 2012). Suffice to note, instead of imposing capital controls, South Africa has, since the demise of the apartheid government regime, liberalised controls in place before 1994 (Ahmed, Arezki and Funke, 2005). One could argue that South Africa (a country that was



blacklisted from the markets due to its policies during the apartheid era) needed to liberalise their controls in order to attract investments (Mohamed, 2006). Notwithstanding the foregoing, the global financial crisis and the volatile nature of investments in South Africa require policy makers to consider carefully whether the liberalisation of controls is the best option at the moment, given the external forces that dictate the flow of foreign direct investments (FDI).

The study focuses on a ten-year period beginning in 2003 and ending in 2013 and uses quarterly data to enhance the number of datasets. Further, the study focuses on the mining industry for a number of reasons. The mining industry is central to the South African economy by the fact that nearly 60 per cent of the country's export revenue is attributable to mining, mineral and secondary beneficiated products (Leon, 2012). The mining industry's contribution to the national economy and indeed to virtually all components of positive growth and development in South Africa, has always been and continues to be considerable (Chamber of Mines of South Africa, 2013). The industry which is now the fifth largest in the world in the world, accounts for over 8% of South Africa's GDP on a direct basis (Chamber of Mines of South Africa, 2013). In the year 2012 the mining industry created 1 365 892 jobs, paid out R 20.9 billion plus R 5.6 billion in corporate taxes and royalties and earned 43% of forex in exports by value (Chamber of Mines of South Africa, 2013). It is said that globally diversified miners with South African operations distributed US\$ 49bn to their stakeholders in 2010; most of which (41 per cent) went to industry suppliers, followed by 18 per cent to employees and communities, 11 per cent to the South African Government in taxes and similar charges, 21 per cent to the mines themselves and only seven per cent to shareholders (Leon, 2012). Despite South Africa's impressive mineral resource inheritance and the longest sustained commodities boom, there has not been much growth in mining production (National Treasury, 2011).

The study focuses on four key variables, over a ten year period, that are deemed important to ascertain what factors affect investment in the mining industry namely, FDI, the exchange rate of the rand to the dollar, real GDP per capita, and wages in the mining industry.

In this regard therefore the question that is asked is whether the liberalisation of capital controls has positively affected the inflow of FDI in the mining industry. Suffice to note, reference to the liberalisation of capital controls in the study is in respect of the country's change of policy in respect of the regulation of the exchange controls, that is, allowing the

inflow and outflow of capital that tilts the balance of reserves. This is measured by the exchange rate of the rand to the dollar for the period under review. The study aims to ascertain whether this change in policy has had a positive impact on the inflow of FDI in the mining industry. The study further focuses on the effect of the changes in the unit labour costs in the mining industry citing the fact that in contrast to the liberalisation of exchange controls the labour market has experienced stiff regulation in the form of protectionism of the labour force.

It is hoped that the outcomes of the study will contribute, where possible, to the definition of policies in respect of the investment of FDI.

1.2 Research Question

Has the liberalisation of capital controls positively affected the inflow of FDI in the mining industry in South Africa?

1.3 Objectives

The objective of the study is to identify whether the liberalisation of capital controls in South Africa has had an effect on FDI in South Africa. More specifically the study will seek to identify whether the relaxation of capital controls has brought about an increase of FDI to the mining industry.

The study aims to highlight the fact that on the one hand the liberalisation of capital controls with respect to capital inflows is not equitable to the increment of FDI, and that other factors should be considered in the definition of policies aimed at attracting FDI in the country to avoid a mismatch between what the drivers of FDI are and the policies implemented to make the country attractive to foreign investors.

The study is limited to a period of ten years from 2003 to 2013.

1.4 Significance of the Study

The importance of a study on capital controls cannot be overemphasised. The study begins by providing a background on capital controls and how these have evolved to assist countries faced with financial crises get out of turmoil. It outlines the composition of capital controls in South Africa and seeks to provide an understanding of why the country has elected to liberalise capital controls. The question asked is whether the liberalisation of capital controls is the best strategy for South Africa, citing the fact that the global market has embraced the

need for capital controls to avoid a financial crisis like the one witnessed recently. The study is limited to the effect of the liberalisation of capital controls, with the main focus being the effect of exchange controls, on the flow of FDI in the mining industry.

The significance of the study is therefore to develop the argument that the liberalisation of exchange controls should not be undertaken pre-maturely and in isolation of factors that are country specific. Foreign exchange policy regulations are said to have a significant effect on the profitability and debt burden of a company (John Luiz and Meshal Ruplal). In the mining industry it is noted that during the operational phase of the mine, mining companies seek favourable exchange rates in order to increase profit margins (John Luiz and Meshal Ruplal). Mining companies seek countries with stable exchange rates during the construction phase of a mine as it is common for expensive imported capital equipment to be used in projects (John Luiz and Meshal Ruplal).

Foreign exchange regulation should therefore be aimed at stabilising a country's currency to attract FDI. It is noted that liberalisation of exchange controls may not have this effect. With specific reference to South Africa the liberalisation of capital controls may not necessarily influence the inflow of FDI given the fact that multi-national companies consider other factors other than exchange rate controls when taking a decision to invest. Of importance is the cost of labour. Various studies are reviewed to identify the effect of the regulation of labour in the form of protectionism. As will be highlighted in the literature review what comes to light is the fact that labour costs play a role in the determination of FDI in a country. Of significance however is the identification of what is the effect of changes to the labour costs in the mining industry in South Africa noting the stiff labour regulation in the country.

Suffice to note from the research undertaken, it is clear that the study on the effects of labour costs has not received significant interest. It is assumed that the reason for this is the fact earlier studies seem to have focused on other determinants of FDI. Farhad, Alberto and Ali (2001) give an example of a study by Root and Ahmed (1979) who find that none of the variables they use as proxies for human capital and skilled labour had significance as a determinant of FDI inflows for the 58 developing countries they considered. They note however that the sample period for Root and Ahmed's study, 1966-70, may well be the case that at the time human capital was not such an important location-specific advantage. This has however changed as noted by the authors. They state that with respect to the cost of labour as a location-specific advantage of developing countries it is argued that as a result of

new technological advances and the concomitant shift of FDI toward more capital, knowledge and skill-intensive industries, the presence of a well-educated pool of labour has become increasingly attractive for transnational corporations relative to low labour costs by themselves (Farhad, Alberto and Ali, 2001).

Additionally it is noted that investment is highly dependent on labour cost as it represents a large percentage of production cost (H.P. Janicki and P.V. Wunnava, 2004). What comes to the fore is that a study on capital controls should not be undertaken in isolation of factors such as labour costs and more specifically in respect of South Africa whose labour market is significantly regulated.

Similarly is the significant role played by labour unions in the determination of wages for mine workers. This is evidenced by examples such as the violent wildcat walkouts in the mining industry in 2010 perpetrated by unionised workers which cost billions of dollars in lost output, dented economic growth and led to damaging downgrades of South Africa's credit rating (BullionStreet, 2013). The mining industry is said to have lost 361 113 work days in 2010 and 370 473 work days in 2011 (Department of Labour, 2011). As a result it is noted that employers are now in agreement with many economists that it is becoming non-profitable to invest in the country due to the high costs of labour, with decreasing productivity fuelled by continued strikes (Goldberg, J., 2011). Goldberg, J notes that these will slowly becoming counter-productive and will ultimately "lead to job losses as the employers can no longer pass the costs to the consumers.

To surmise the significance of this study is the evaluation of what effect factors like labour costs in the mining industry have had to the flow of FDI over and above the liberalisation of exchange controls. Obviously from the foregoing it is clear that it is expected that given the regulation of the labour market in South Africa and the resulting increase in the labour cost the country is unlikely to be attractive to FDI. Few studies have however been undertaken to confirm this hypothesis, more specifically in respect of the mining industry in South Africa. The intention is therefore to provide evidence in support of this hypothesis or contrasting same based on the results of the data analysis.

1.5 Research Assumptions

The research assumptions are that the variables selected and the data to be used is sufficient to provide a conclusive response to the research question. It is highlighted under the research



methodology and techniques that there are a number of drivers of FDI. The assumption made in the study is that the variables selected to undertake the study are the right variables to undertake the study.

Assumptions are also made in respect of the sufficiency of the time period applied in the study. It should be noted that the period provides a good timeframe for a study such as the one undertaken here. Fiscal policy has evolved significantly post the apartheid era in respect of the liberalisation of capital control. It is therefore against this background that the period between 2003 and 2013 is deemed appropriate for this study. Quarterly data is used to ensure that the number of datasets is sufficient.

1.6 Hypothesis

Capital liberalisation (proxied by a flexible exchange rate) would result in increased inflow of FDI.



CHAPTER TWO

LITERATURE REVIEW

2.1 History

Belligerents in World War I are said to have developed modern capital controls to maintain a tax base to finance wartime expenditures (Neely, 1999). Controls began to disappear after the war, only to return during the Great Depression of the 1930s (Neely, 1999). The return of the controls is attributed to the need for the ability to reflate economies without the danger of capital flight (Neely, 1999). This was reaffirmed by the recognition by the Bretton Woods Conference of the fundamental link between exchange and capital controls and international trade (Tamirisa, 1999). The conference led to the creation of the International Monetary Fund, which institution was created to assist the elimination of foreign exchange restrictions that were viewed as hampering the growth of the world trade (Tamirisa, 1999). Suffice to note, the maintenance of capital controls was not viewed as being inconsistent with this objective. Capital controls were considered necessary for supporting the system of fixed exchange rates and thus fostering trade (Tamirisa, 1999). Restrictions imposed on asset transactions aimed at coping with the balance of payment difficulties proved, in the long run, to be costly (Neely, 1999). Gradually developed countries began to remove these restrictions most prominently in the 1970s (Neely, 1999). The trend was also witnessed in less developed countries with the liberalisation of markets. As stated in the introduction, the debate on capital controls has re-emerged following the financial crises witnessed in the 1990s and will gain more impetus as countries grapple with the recent global financial crisis.

The debate held over time with respect to capital controls is whether their implementation has been effective. Experiences from trends observed by various economists have been used to evaluate the effectiveness of capital controls. For example, proponents of capital controls have used the Chilean example to advocate for capital controls citing the success of these controls in significantly lengthening the maturity composition of capital inflows to Chile (Cordella, 2003). It has been suggested that emerging markets should restrict capital mobility to prevent future crises (Gregorio et al, 2000). Opponents of capital controls have stressed, with respect to the Chilean experience, that the effectiveness of the capital controls imposed in Chile is mixed (Cordella, 2003). It is noted that while the composition of capital inflows was altered in favour of longer term flows, the goal of reducing the total volume of funds entering the country was not achieved (Cordella, 2003).

2.2 Drawbacks of the Study on Capital Controls

An observation made from the literature on capital controls is that most studies have been limited in one way or another in providing a decisive answer on the effectiveness of capital controls. For example, some authors have criticised studies on capital controls on the basis that they do not usually differentiate between controls on inflows and controls on outflows (Reinhart, Smith 2002). Reinhart and Smith note that there is a reason to believe that the effectiveness of capital controls is not symmetric and, in particular, that controls on inflows may be more effective than controls on outflows. J. De. Gregorio et al. (2000) have noted that in the past, there has been no comprehensive attempt at evaluating the different aspects of Chile's experience on capital controls. One should note the caveat highlighted by Chanda with respect to the limitations of data on capital controls (Chanda, 2005). Chanda notes that, unlike the variety of indices that are readily available or have been created to measure openness in international trade, there is only one traditionally used variable for financial openness. He notes that the IMF's annual publication, Exchange Arrangements and Exchange Restrictions, has, since 1967, included a table that lists whether each country has in place various restrictions on exchange rates and payments in international transactions. The table also lists whether countries had restrictions on payments for capital transactions. He argues that the limitation of this entry is that it is completely binary and that countries are either deemed to have controls in place or they are not. Finally, he states that the obvious drawbacks of such data is that there is no indication of the degree of capital controls making it difficult to extract information and further that there is no way one can distinguish between various types of capital controls.

Palma's "three stylised routes"

Despite these drawbacks, recent studies have, in an attempt to provide conclusive answers on the effectiveness of capital controls, applied different models to specific 'effects' of capital controls. For instance Palma Gabriel (2000) examines the period between the liberalisation of the economy and the onset of financial crisis in selected countries and devises what may be called the "three stylised routes" to financial crisis. Route 1 (R1) is drawn from the Chilean experience, Route 2 (R2) from Korea and Route 3 (R3) from Brazil (Palma 2000). Palma surmises that R1 countries are characterised by a huge expansion in private consumer credit as countries try to absorb inflows. He states that R2 countries are also characterised by a huge expansion in private credit, but that this time, instead of an expansion in consumer credit,

there is a huge expansion in private sector investment. Palma argues that in R2 countries, the expansion of private credit was entertained to bolster high levels of investment and in R1 countries the supply of foreign capital created the demand for fuelling expectations and optimism regarding the future performance of the economy. R3 countries are characterised as countries where there is credit contraction as the authorities act to curtail expansion by placing an “iron curtain” around incoming flows (Palma, 2000). Palma notes that the iron curtain consists of increasing reserves, high degrees of sterilization and high interest rates.

Palma’s study lays a good foundation for other studies on capital controls. Mckensie, Rex and Pon-Vignon, Nicolas note that the value of Palma’s study from a South African point of view is that having identified a stylised path, policy prescriptions can be constructed that represents a best practise that is derived from the experience of other countries based on all the available theory and evidence. After analysing a set of South Africa’s macroeconomic data Rex and Nicolas (2012) note that the data reveals a number of economic phenomenon, which is closely parallel to that of R1 countries in Palma’s stylised facts.

This analogy brings us to the question whether the liberalisation of capital controls is the best strategy to apply, citing the financial crises that occurred in the R1 countries that have, according to Rex and Nicolas, similarities with South Africa. In answering this question one has to look at the history of South Africa in respect of its blockage from the international community in the apartheid era and the capital controls that were put in place at the time to protect the market. This provides the context within which it could be said that South Africa has in recent years liberalised capital controls to attract capital. Notwithstanding the foregoing, the prevailing circumstances, that is, external and internal forces such as the current financial crisis and the utilisation of capital in unproductive investments respectively, need attention for one to provide a conclusive answer to the foregoing question.

Paragraphs below provide a review of the political and economic history of South Africa. This is deemed necessary with regard to getting a good understanding on the macro-economic factors that have shaped the reform process in the country which includes amongst other reforms the focus of the study, that is, liberation of capital controls and additionally labour reforms that are also a subject of this study.

2.3 South Africa's Policy Evolution

The South African government adopted an orthodox economic reform programme, namely the Growth, Employment and Redistribution (“GEAR”) in 1996 (Padraig, 2002). This is attributed to the recognition that apartheid was a heavily statist system which in the minds of many members of the new government led to the economic stagnation that was associated with protectionism (Padraig, 2002).

One of the steps taken by the 1996 government was the liberalisation of exchange rates which led to the rapid depreciation of the Rand (Padraig, 2002). The government adopted GEAR in an attempt to hedge the fall of the Rand by reassuring international investors of its economic orthodoxy (Padraig, 2002).

The South African government is said to have attempted a compromise between globalisation and social democracy (Padraig, 2002). However this was undermined as the state was increasingly characterised by embedded or institutionalised dependence on global forces (Padraig, 2002). This dependence was manifested in ‘negative autonomy’ from domestic social forces. For clarity purposes, Padraig (2002) explains that negative autonomy is where the state appears autonomous from domestic social forces, but that autonomy is the obverse of dependence on global forces, and therefore reflective of their priorities. Thus, he notes the state liberalises the economy to maintain the ‘confidence’ of international investors and uses the global market to discipline productive capital and labour, rather than being able to discipline them on its own to achieve developmental goals. In this way, the state uses its power to constrain its power. As the state globalises, the success of government’s development strategy increasingly depends on private sector actions and investment (Padraig, 2002).

Examples have been given to highlight weakness in the system such as the one adopted by the South African government. A case in point is mining companies, where market imperfections arise from both government legislation controlling ownership and social/community actions that threaten operations (John Luiz and Meshal Ruplal, 2010). The authors cite the use of legislation to regulate the ownership in industries which governments consider to be strategic. Similarly examples cited by UNCTAD include Algeria, where state-run organisations must hold a minimum of 51% in any oil and gas enterprises. Other examples include the nationalisation of the Bolivian and Venezuelan oil and petroleum industries. The proposed nationalisation of Zimbabwean mines as well as legislation similar

to South Africa's Black Economic Empowerment legislation, which requires local black-owned companies to own at least 26% of mining companies, will result in mining companies viewing these countries as less attractive from the investment perspective (John Luiz and Meshal Ruplal, 2010).

Additionally as is noted by Padraig (2002), given the country's history of brutal labour exploitation under apartheid, the government opted for a 'regulated flexibility' in the labour market, that is, minimum wages, combined with a recognition of a two-tier labour market of permanent protected and temporary less protected workers. While unemployment had increased since 1994, so too were real wages for those in employment (Padraig, 2002). The government's supply-side industrial strategy was meant to raise productivity and thereby allow higher wages to be supported (Padraig, 2002).

Despite South Africa's high labour productivity, high labour costs mean that unit labour costs (labour costs as per cent of value added) are higher in South Africa than in most of the comparator countries outside of Eastern Europe (G. Clarke et al, 2008).

In his assessment of why South Africa isn't growing faster G Clarke *et al* (2008) use the Doing Business Report 2006 rankings of countries in respect of several sub-indices, that is, difficulty of hiring, difficulty in firing and firing costs to argue that South Africa's ratios in comparison to other countries is high. The authors note that the difficult of hiring index for South Africa is 56, which is higher than in any of the comparator countries except Brazil and higher than the average for the OECD (G. Clarke et al., 2008). Since higher values indicate more restrictive regulation, this suggests that hiring regulations are relatively strict in South Africa (G. Clarke et al, 2008).

A similar picture emerges for firing restrictions. South Africa scores 60 on the *difficulty of firing index*, once again higher than any of the comparator countries except Brazil and higher than the OECD average (G. Clarke et al, 2008).

One factor is that the labour regulation in South Africa is burdensome; making hiring and firing difficult which discourages firms from entering labour-intensive areas (G. Clarke et al, 2008). Labour costs are also high, especially for skilled workers (G. Clarke et al, 2008). The high cost of skilled labour and other evidence from the investment climate might explain why firms are more likely to say that the availability of skilled labour is a serious problem than any other area of the investment climate (G. Clarke et al, 2008).

As highlighted earlier the South Africa business environment is further encumbered by programmes like the black economic empowerment which are said to deter investment as a consequence of firms utilising capital finance changes in share ownership (G. Clarke et al, 2008). New shareholders may similarly utilise capital to finance share purchase rather than investing in greenfield activities (G. Clarke et al, 2008). Foreign investors, more especially those that rely on proprietary technology and are accordingly reluctant to dilute equity in regard to their subsidiaries, may be dissuaded from investing in South Africa (G. Clarke et al, 2008).

One can therefore not ignore the significance of labour costs in respect of the role they play as a determinant of FDI flow. In an examination of the hypothesis that the level of human capital in host countries may affect the geographical allocation of FDI to developing countries the author notes that they found a statistically significant result and recommended that developing countries improve their policies to increase their human capital capabilities, which are necessary not only to increase the volume of FDI inflows but also to improve its quality (Noorbakhsh et.al in A. H. Suliman & A. V. Mollick, 2009). It is noted that most African countries lack the skill and technology infrastructure to absorb larger FDI flows in the primary sector and that the low level of African countries' industrial capabilities makes it difficult for African countries to move forward in the global environment.

The question to be investigated by this study is therefore whether labour costs in South Africa have a significant influence to the flow of FDI in the country. An empirical analysis is undertaken in chapter four in this regard.

2.4 Liberalisation of Capital Controls in South Africa

G N Farell notes that in September 1985 South African authorities declared a standstill on repayments of a large portion of the country's foreign debt commitments and reintroduced exchange controls over non-residents. These controls are said to have created the financial rand DRS system that together with existing controls on resident capital account transactions constituted a comprehensive system of controls (Farell, 2001).

This two-tier currency system was subsequently abolished in 1995 (CUTS, 2003). The exchange control restrictions on the free convertibility and repatriation of local sale proceeds of non-resident owned South Africa investment were also repealed (CUTS, 2003). In line with the liberalisation of its investment regime, South Africa maintains no restrictions on the



repatriation of capital investment, profits or the transfer of dividends by non-residents (CUTS, 2003). Interest payments are also freely transferable, however royalties, license fees and certain other remittances to non-residents require the approval of the South African Reserve Bank (CUTS, 2003).

Recently, the South African Reserve Bank allowed international headquarter companies based in South Africa to 'raise and deploy capital offshore without exchange control approval' (Ashman, Fine and Newman, 2011). Companies will in this regard be able to take out assets from the country without paying the 10 per cent exit levy required before the lifting of these restrictions (Ashman, Fine and Newman, 2011). Exchange controls on domestic companies are to be reformed to remove barriers to international expansion (Ashman, Fine and Newman, 2011). In addition, the South African Reserve Bank intends to implement an 'Exchange Control Voluntary Disclosure Programme' which is effectively an amnesty for illegal capital flight, as part of the gradual liberalisation of exchange controls (Ashman, Fine and Newman, 2011).

2.5 Ideal Policy for South Africa in respect of Capital Controls

As alluded to earlier, one would question the rationale behind the liberalisation of capital controls. G N Farrell (2001) notes that it seems likely that the financial rand system insulated the commercial Rand exchange rate from volatility in non-resident portfolio capital flows in the 1989-95 period. One would assume that studies like this would influence the South African government into maintaining capital controls.

Notwithstanding the foregoing various authors have called for the liberalisation of capital controls. Ahmed, Arezki and Funke (2005) note that over the past 10 years, South Africa has gradually relaxed capital controls, but retains some, including the requirement that exporters repatriate their foreign exchange earnings within six months. It is common cause that these restrictions have been relaxed further. They state that according to their results, these types of requirements deter FDI. They note that overall their findings indicate that the relatively low share of FDI can be addressed, in part, by government policies, including further trade and capital account liberalisation. They state that a reduction in exchange rate volatility and an increase in reserves, accumulated at a pace dictated by prevailing market conditions, would most likely also lead to changes in the composition of capital flows and increase the share of FDI.

Dr Angermann (2005) notes that the time is ripe for the removal of foreign exchange controls, but that alone will not promote direct investment in the country. As stated earlier she notes that dismantling the foreign exchange restrictions would initially lead to an increase in capital exports. She gives the example of large mining companies whom she states can close down unprofitable mines in the home territory and invest in neighbouring countries. She argues that simply being able to send capital abroad unimpeded can prompt investors to channel funds into the domestic market.

These arguments have been rebutted by various authors who believe that the liberalisation of capital controls is ill informed. Mohamed (2006) notes that FDI is an important element of the South African government's economic policy. He states that the government seems to believe that their chances of attracting FDI and more access to capital will improve if the government shows investors that it is committed to maintaining orthodox macroeconomic fundamentals and other elements of the Washington Consensus. He notes that the government does not seem to be overly concerned with the disruptive effects that capital flows can have on a country's financial system and economy as a whole, despite numerous financial crises in developing countries since the mid-1990s and the South African currency crisis in 2001.

He notes that Palma (2000) convincingly shows that large capital inflows are the key to explaining financial crises in developing countries since the mid-1990s, despite the different absorption methods witnessed in these countries. Mohamed states that capital flows are positively correlated with large-scale capital flight from the South African economy. He notes therefore that the surge in capital inflows was not associated with economic activity that would lead to long-term growth in the economy. Instead, he points out that one may associate the surge in net capital flows with maintaining exuberance that leads to higher share prices indices, more imports, growth in private consumption and high levels of capital flight. He notes that all these factors have the potential of weakening the economy over time and gives the 2001 South African Rand currency crisis as a good example of how factors associated with surges in short-term flows have the potential to weaken the economy.

Simply put, his argument is that the lesson to be learnt is that uncontrolled capital flows have been very disruptive for the South African economy, as these flows are not absorbed into productive activities, but that they reinforce negative trends present in the South African economy.

Ashman, Fine and Newman argue that the liberalisation of exchange controls is peculiarly inappropriate in South Africa as, under the impact of the global economic crisis, even the major neoliberal international financial institutions, such as the IMF, are confessing that they have been wrong or too dogmatic in the past, cautiously recognising the legitimate role to be played by capital controls in regulating flows of capital and guarding against instability due to hot flows of money.

Their argument is that the interests of conglomerate capital has managed to exert continuing influence over economic policy in the post-apartheid period, not least as such domestic conglomerates have both adjusted to the imperatives of globalisation that were constrained under apartheid whilst fully embracing over the past twenty years the processes of *financialisation* that have so obviously accelerated with such disastrous consequences for the world economy.

With specific reference to the mining industry, it is clear that other factors carry more weight in respect of influencing decisions of multinationals. Mining companies seek countries with stable exchange rates during the construction phase of a mine as it is common for expensive imported capital equipment to be used in projects (UNCTAD, 2007). It is noted that three factors have emerged as very important factors influencing the internationalisation of South African mining firms: security of tenure, political stability, and availability of infrastructure (Luiz and Ruplal, 2010). Luiz and Ruplal note that these factors were statistically significant in their findings in respect of determining the flow of FDI (Luiz and Ruplal, 2010). Luiz and Ruplal note that from interviews carried in their study, respondents indicated that much attention is paid to managing these factors with the host country government. They state that factors deemed important were the restriction in ownership levels, social licence to operate (or CSR issues) and revenue sharing. They note that mining companies are able to manage these factors through direct negotiation with host country governments as well as communities and action groups. They state that the key point is that these factors are to a large extent within the mining company's control. In addition, they note that the cost of managing these factors can be factored into the investment calculations upfront and, as long as a positive net present value (NPV) is obtained, companies are willing to accept the reduced revenues resulting from revenue sharing and restricted ownership levels as well as the added cost of ensuring community and environmental issues. They point out that interestingly, securing control of supply, exchange rate fluctuations and host country cultural similarities with South Africa emerged as less important.

In light of the foregoing, this study seeks to add to the growing voice of the concerns arisen in respect of massive inflows noting the fact that these can lead to exchange rate overshooting or inflate asset price bubbles, which can amplify financial fragility and crisis risk (Ostry et al., 2010). More broadly, following the crisis, policymakers are again reconsidering the view that unfettered capital flows are a fundamentally benign phenomenon and that all financial flows are the result of rational investing/borrowing/lending decisions (Ostry et al., 2010). Concerns that foreign investors may be subject to herd behaviour, and suffer from excessive optimism, have grown stronger, and even when flows are fundamentally sound, it is recognised that they may contribute to collateral damage, including bubbles and asset booms (Ostry et al., 2010).

The question is how best countries should handle surges in inflows which could pose both prudential and macroeconomic policy challenges. Ostry et al. note that the tools are well known. They state that these include fiscal policy, monetary policy, exchange rate policy, foreign exchange market intervention, domestic prudential regulation, and capital controls. They provide that the appropriate policy mix is likely to depend on the state of the economy, that is, how close it is to potential; the level of reserves; the quality of existing prudential regulation; the scope to allow the currency to strengthen; and the likely persistence of the inflows.

They discuss the various policy interventions namely exchange rate appreciation, reserve accumulation and sterilization. In respect of the exchange rate appreciation, they note that the first question that should be asked is whether the exchange rate should be allowed to appreciate. They state that although countries are frequently concerned that an appreciation will damage competitiveness of the tradable sector, the multilateral context is paramount here. The rationale given is that, if the exchange rate is undervalued from a multilateral perspective, the appropriate response would be to allow the nominal exchange rate to appreciate passively in response to the capital inflows. However, when the exchange rate is already overvalued and there are concerns about the impact of an appreciation on competitiveness, a more proactive policy response is required. Ostry et al. note that the next question to ask is whether the country has a relatively low level of foreign exchange reserves and whether some further reserve accumulation would be desirable. They contend that if reserves are required, capital flows may present a useful opportunity to augment the central bank's reserve holdings. Lastly, in respect of sterilisation, they note that if there are inflation concerns, the resulting increase in the money supply can be sterilised through open-market

operations or, more generally, a corresponding decrease in domestic credit. They caution however that there are limits to sterilisation.

Ostry et al. highlight that monetary and fiscal policies and controls on capital inflows should be considered where the central bank has exhausted the sterilisation possibilities and risks losing monetary control, or if it does not want to accumulate further reserves. The policy response suggested is lowering interest rates, thus reducing incentives for inflows, and tightening fiscal policy, particularly when capital inflows are driven by fiscal expansion thus reducing currency appreciation pressures. Lastly controls on capital flows are deemed as an appropriate addition to the policy toolkit in the face of substantial inflows.

In light of the foregoing one cannot rebutted the argument that capital controls are a legitimate part of the toolkit for the management of capital inflows. However one should not be blind to the fact that the decision on their use should reflect a comparison of the distortions and implementation costs that they may impose and the benefits from regaining macro policy control and reducing financial fragility (Ostry et al., 2010). As affirmed by Ostry et al., there is however a need for a regular reassessment to ensure that capital controls remain the appropriate response, as long as these are maintained.

2.6 Conclusion

Academic literature points to a number of conclusions. Proponents of capital controls have given examples of countries where capital controls have been deemed to have successfully defined the form of capital controls. Opponents of capital controls on the other hand have criticised studies showing the positive effects of capital controls by citing the fact that they do not significantly influence the level of investments that flow into a country. Authors writing on South Africa have criticised the decision of policy makers to liberalise exchange controls in isolation of other policies and note that it is ill-informed to do so bearing in mind the distortions this creates and the inability to attract FDI. Suffice to note, there are distinctive examples of policies that are miles apart. For example South Africa has adopted a relaxation of exchange rate controls. In contrast the labour market has seen significant regulation to protect the labour force. Arguably these extremes may distort the gains that governments seek to achieve in respect of the attraction of FDI.

From data gathered it is clear that the exchange rate of the dollar to the rand has fluctuated willy-nilly in the period under review. The averages from the quarterly data collected

highlight the following rates in respect of the exchange rate of the dollar to the rand: 7.8 in 2003, 6.4 in 2004, 6.3 in 2005, 6.8 in 2006, 7.0 in 2007, 8.2 in 2008, 8.4 in 2009, 7.3 in 2010, 6.7 in 2011 and 8.2 in 2012.

It is also observed that in the period leading up to the review and consequently the period under review the inflow of FDI in South Africa has not been significant. In-fact in some years the country has since a drop in the inflow of FDI. The South African National Treasury in its discussion paper of 2011, a review framework for cross-border direct investment in South Africa note that the average inflow of FDI as a percentage to the GDP for the period between 2000 and 2004 was 1.8 percent. Similarly the paper highlights that the average inflow for the period between 2005 and 2009 was 2.0 percent. The 2010, 2011 figures show a gloomier picture, that is, 0.3 and 1.5 percent respectively (World Bank Data).

On face value one would argue that the data shows that the relaxation of controls in respect of the removal of exchange rate controls cannot be said to have had a positive impact on the inflow of FDI in South Africa.

In addition data gathered on the unit labour costs for the period under observation reflect the fact that the unit labour cost has increased every year, 5% (of the cost in 2003) in 2004, 6% in 2005, 19% in 2006, 17% in 2007, 27 in 2008, 14% in 2009, 6% in 2010, 10% in 2011 and 13% in 2012. The question is what effect these changes have had in the inflow of FDI.

What follows in the next chapter and the chapter thereafter is therefore a discussion on the different variables used in the study, the research methodology and techniques and the actual empirical analysis. It is hoped that results from the empirical analysis will provide insight on the effects of the various variables in respect of the inflow of FDI in South Africa.

CHAPTER THREE

RESEARCH METHODOLOGY AND TECHNIQUES

3.1 Justification of the Quantitative Approach

The nature of the study, that is, one which seeks to capture the effect of different variables on the dependent variable, as is the case with this study which applies variables such as exchange rate, labour costs, real per capita GDP which are quantitative in nature necessitates a quantitative study. Additionally the hypothesis highlighted in chapter one is best verified through empirical investigation rather than a qualitative inquiry.

3.2 Research Techniques

The data that is used is going to be subjected to a number of tests in order to determine the appropriate estimation approach. Firstly, descriptive and normality tests are undertaken to assess whether the data is normal. The Granger causality test is undertaken also to determine causality. Correlation coefficients are undertaken to identify whether there are linear relationships between the variables.

There is a need to undertake a test for stationarity in all the variables. This is done using the augmented Dickey-Fuller (“ADF”) approach. Two motivations are given for this. One is the fact that knowing the order of integration is crucial for setting up an econometric model and do inference (Bo Sjö, 2008). The second and most common motive is to investigate the properties prior to the construction of an econometric model (Bo Sjö, 2008). In this regard, the unit root test (stationarity test) is important for the cointegration testing. Once the order of integration is established, during the ADF testing, the study then proceeds to undertake a test for cointegration. Cointegration is undertaken only if the variables are integrated in the same order, that is, a variable is $I(0)$ or $I(1)$ or $I(2)$ using the Johansen test.

If the variables are not cointegrated then there is no need to estimate the error correction model (“ECM”). It is common cause that the ECM captures the short-term dynamics in variables as well as the long-term relationships among variables.

3.3 Data collection

The research uses quarterly time series data obtained from the World Bank data bank as well as online Reserve Bank of South Africa quarterly bulletins. Four variables shall be used in the study, namely: FDI, exchange controls, real GDP per capita, and unit labour costs in the mining industry. The variables are discussed below.

3.4 Description of Variables

FDI

In South Africa, investment by foreigners is considered direct investment if it comprises ownership of a branch or participation in a partnership in South Africa; ownership of at least 10% of voting rights in an organisation in South Africa; ownership of less than 10% of voting rights, provided the foreigner is able to exercise effective influence over the policies of the organisation, for example, in terms of royalty and management agreements (Fedderke and Romm, 2006).

Drivers of FDI have been identified to include both policy and non-policy factors (Fedderke and Romm, 2006). Fedderke and Romm identify non-policy factors to include market size, distance, factor proportions and political and economic stability. They also identify policy factors to include openness, product-market regulation, labour market arrangements, corporate tax rates and infrastructure. Anyamwu (2012), in the same breath, notes that there is a positive relationship between market size and FDI inflows; openness to trade has a positive impact on FDI flows; higher financial development has negative effect on FDI inflows; the prevalence of the rule of law increases FDI inflows; higher FDI goes where foreign aid also goes and natural resource endowment and exploitation (such as oil) attract huge FDI.

Fedderke and Romm's study lay a good foundation in respect of the research techniques that this study indicates to apply. The implication of their findings is that determinants of FDI in South Africa lie in the determinants of the net rate of return, as well as the risk profile of the FDI liabilities. They note that reducing political risk, ensuring property rights (most importantly bolstering growth in the market size) as well as wage moderation (ideally lowering real wages), lowering corporate tax rates, and ensuring full integration of the South African economy into the world economy all follows as policy prescriptions from their empirical findings.

Given the insufficient quarterly data in respect of FDI in the mining sector the variable is proxied by Gross Fixed Capital Formation in the sector. Gross Fixed Capital Formation is a good substitute for FDI as it represents investment created in the period for the sector. Suffice to note, most of the mining concerns in South Africa are foreign owned and as such the presence of foreign investment.

Capital Controls – Exchange Rate Controls

The liberalisation of exchange rate controls by the South African government brings to question the risk associated with the probability of a volatile currency influenced by market forces. This is more so relevant to the question of whether the liberalisation of these controls attracts FDI into the country. In any FDI undertaken, there are some risks that need to be considered; among them is exchange rate volatility (Anthony and Kwame, 2008). Exchange rate volatility is the most basic risk measure that confronts such investors, and it refers to the short-term deviations of the exchange rate around its long-term trend (Anthony and Kwame, 2008). It is argued that the level of the exchange rate affects FDI in a number of ways, depending on the destination of the goods produced (Chowdhury and Wheeler, 2008). Literature has noted that the higher the volatility of the exchange rate, the higher the probability that an investment opportunity be deferred (Abott and Vita, 2011).

Notwithstanding the foregoing, it would seem that the flow of capital is determined by other factors other than the liberalisation of exchange rate controls. Mohamed Seeraj (2006) in an examination of the period up to 2002, argues that the surge in portfolio capital flows to South Africa and the related increased extension of credit to the private sector during the 1990s was not associated with increased levels of fixed investment, but with increased household consumption, financial speculation and capital flight. In the same breath, Dr. Ingrid Angermann (2005) notes that the liberalisation of foreign exchange restrictions in South Africa (with specific reference to the mining industry) promotes the flight of capital due to the diversification of companies. Dr. Angermann states that this is particularly relevant at present, as the prices of precious metals have accelerated rapidly. However, he also states that the simultaneous surge of the Rand has largely eroded the associated profits.

In this regard, the study hypothesises that the liberalisation of exchange controls does not have a significant relationship with the inflow of FDI in South Africa.

Real GDP Per Capita Growth

The local conditions in a country are said to have an impact on FDI inflows (Alguacil, Cuadras and Orts, 2011). Lim (2001) notes that of all the studies he has surveyed, the most significant determinant of FDI is market size. This is measured by real GDP per capita as a proxy of market size. It is argued that prospective growth, GDP Growth being the proxy, signals higher returns which attract FDI to a host and reduce outflows from a source country (Eicher, Helfman and Lenkoski, 2012). Asiedu (2004) notes that the empirical relationship between real GDP per capita and FDI is conflicting. She notes that using the inverse of income per capita as a proxy for the return on capital, Edwards (1990), Jaspersen, Aylward, and Knox (2000) and Asiedu (2002) conclude that real GDP per capita is inversely related to FDI/GDP. In contrast, she contends that Schneider and Frey (1985) and Tsai (1994) find a positive relationship between the two variables. She states that the argument is essentially that higher domestic income and higher growth rates imply a greater demand for goods and services, and therefore make the host country more attractive for FDI.

The study hypothesises that there will be uni-directional relationship between FDI and real GDP per capita reason being the fact that FDI invested in the country in general provides investments in the economy that are consumed given the capacity of the South African's society to consume (Mohamed, 2006).

Labour Costs

It is observed that countries where less skilled labour is cheaper tend to attract more FDI, especially in respect of investments from multi-nationals that are engaged in production (Braconier, Norback and Urban, 2005). This is more so with vertical FDI, which encompasses what is commonly known as “raw material seeking” FDI (Lim, 2001). Investors of this nature tend to seek locations where labour costs are cheaper to reduce the production costs (Lim, 2001). Distinctions are made with respect to the measure of the labour cost as a variable (Bellak, Leibrecht and Riedl, 2007). Bellak, Leibrecht and Riedl note that indicators of labour costs used in various studies (Defever (2006), Boudier – Bensebaa (2005), Murgasova (2005) and Walkenhorst (2004)) can be classified into two groups, namely absolute labour costs and unit labour costs. They state that absolute labour costs reflect expenses borne by the employer associated with an employment relationship. These, they note, are used in the form of total labour costs and gross wages with the latter excluding employers' contributions to social security. These two measures abstract from labour productivity. Additionally, they state that real (nominal) unit labour costs are defined as total



nominal labour costs per employee over nominal (real) GDP per employment. Their study cautions against the omission of the labour productivity component of the definition of labour costs; citing the fact that this biases the coefficient of the total labour costs. It is in this breathe that this study seeks to apply the latter definition in respect of the labour cost variable.

Bellak, Leibrecht and Riedl's study reinforces the argument that high labour costs are a deterrent of FDI. The hypothesis of the study is that unit labour costs have a negative relationship with FDI.

3.5 Conclusion

In light of the foregoing, the liberalisation of exchange rate controls as a variable speaks to the risk profile of the country sighting the potential volatility of the Rand, and the real GDP income per capita and unit labour cost variables correspond to the net rate of return.



CHAPTER FOUR

RESEARCH FINDINGS, ANALYSIS AND POLICY IMPLICATIONS DISCUSSION

Below follows a quantitative analysis of the data sourced from the World Bank and the Reserve Bank of South Africa. E-views eight is used to undertake the quantitative analysis.

4.1 Definition of Variables

The variables of choice are shown and defined below:

$\ln FDI$ = log of Foreign Direct Investment

$\ln exchr\text{ate}$ = log of rand-dollar exchange rate

$\ln l\text{productivity}$ = log productivity index

$\ln unitL\text{cost}$ = log of unit labour cost in the mining sector

$\ln Rgdp_SA$ = log of real Gross Domestic Product (GDP) for South Africa

$\ln GDP\text{mines}$ = log real GDP for the mining sector

$\ln mine_wage$ = log of wage in the mining sector

$\ln rgdppc_SA$ = log of real GDP per capita for South Africa

Rational for variable transformation into logarithms

The transformation of variables into logarithms provides the advantage of working with smaller scales that make the interpretation of the results easy. Transforming data into logarithms is advantageous given the fact that parameters developed out of the regressions represent elasticity, that is, the percentage response of a dependent variable to the one percent (1%) change in the underlying control variable.

Additionally, the transformation also helps in the smoothing of the data. The existence of random variation in data often makes it a mammoth of a task to identify which components actually exist in a time series (Keller, 2009). Smoothing of the data in the study assists the study to reduce random variation (Keller, 2009).

Ex Ante variable Diagnostics

Before any regression analysis takes place the data has to be subjected to various tests for purpose of identifying the suitability of the data, cleaning the data and validation. Data validation in this study is done through a comparison with other data sources. However the validation is done bearing in mind the allowance of minor statistical errors.

The regression analysis undertaken hereunder assumes that the data sourced is fairly normally distributed and as such make same robust. To this end the study-test for normality among the variables identified using the Jaque-Bera approach and undertakes a verification of the results by use of Box-Plot diagrams.

Time profiles of relevant variables

Additionally the study shows the time profiles of some key variables. The rationale for the time profiling is that this may reveal some pertinent features of a series that are not captured by either the descriptive statistics or regressions.

Correlation

Correlation results for some key variables are discussed to identify the relationship between variables.

Grander Causality

The grander causality test is undertaken to determine causality.

Unit root test

The unit root test is undertaken to determine stationarity of the data.

Cointegration test

Cointegration test is carried out to identify whether there is integration between variables.

Regression

Finally a regression analysis is carried out.



Descriptive statistics & Normality Tests

DESCRIPTION	LNEXCHRATE	LNFDI	LNGDPMINES	LNLPRODUCTIVITY	LN_MINE_WAGE	LN_RGDP_SA	LN_UNIT_COST
Mean	1.995391	9.221426	10.13592	4.475713	9.636751	14.38484	5.063375
Median	1.997327	9.344182	10.14284	4.432125	9.693396	14.40137	5.173724
Maximum	2.298577	9.897520	10.21516	4.605170	10.20891	14.50339	5.826000
Minimum		8.372630	10.02141	4.333361	9.035064	14.26845	4.500370
Std. Dev.	0.141406	0.523011	0.048593	0.099421	0.380122	0.074244	0.415328
Skewness	-0.224960	-	-0.542411	0.111298	-0.109980	-0.036886	0.038986
Kurtosis	4.047812	1.504427	2.505707	1.385028	1.606207	1.633141	1.673893
Jarque-Bera	2.275592	4.438114	2.487035	4.650945	3.484323	3.279057	3.088118
Probability	0.320525	0.108712	0.288368	0.097737	0.175141	0.194071	0.213513
Observations	42	42	42	42	42	42	42



4.2 Test for Normality

As highlighted earlier it is important to test for normality of the data in respect of regression inference. The importance stems from the fact that results of a data analysis from a normally distributed series is more reliable and also given the fact that it minimises the chance of unauthentic conclusions.

It is common cause that the null hypothesis to be tested here is that the series is normally distributed against the alternative that it is not. The test statistic that is used is the Jarque-Bera statistic constructed from Skewness (S) and Kurtosis (K) for a given sample of size (n) as is highlighted below. Suffice to note the JB test is a test that seeks to identify whether the sample data has Skewness and Kurtosis matching normal distribution. The equation is represented as follows:

$$JB = \frac{n}{6} (S^2 + \frac{1}{4} (K - 3)^2)$$

The JB statistic follows a chi-square distribution with 2 degrees of freedom.

$$JB \sim \chi^2_{df} \quad (\text{where } df = \text{degrees of freedom which is normally } 2)$$

It is noteworthy however that there is weakness in using the chi-square critical value. This is so because the critical value is overly sensitive in small samples which often results in the rejection of a null hypothesis. To this end the study then relies on the probability-value of the JB statistic which, where smaller than 5% (0.05) the study rejects the null hypothesis that the data is normal. In the table above all the variables show normality as the p-values of all the JB statistics are more than 5%.

4.3 Causality

There is need to test for Granger causality in order to assist us with the possible nature of regressions to be used. The table below shows the results of Granger Causality tests using two (2) lags as per the Lag Selection criteria results.

Granger Causality Tests Table

Pairwise variables	Direction of causality	Suggested regression approach
lnFDI vs lnGDP	Unidirectional causality	lnGDPmines is dependent

lnFDI vs lnProductivity	Unidirectional causality	lnproductivity is dependent
lnmine_wage vs lnFDI	Unidirectional causality	lnFDI is dependent
lnFDI vs lnRGDP_SA	Unidirectional causality	lnRGDP_SA is dependent
lnproductivity vs lnGDPmines	Unidirectional causality	lnGDPmines is dependent
lnmine_wage vs lnGDPmines	Unidirectional causality	lnGDPmines is dependent
lnunitLcost vs lnGDPmines	Unidirectional causality	lnGDP mines is dependent
lnmine_wage vs lnproductivity	Unidirectional causality	lnproductivity is dependent
lnmine_wage vs lnRGDP_SA	Unidirectional causality	lnRGDP_SA is dependent
lnunitLcost vs lnRGDP_SA	Unidirectional causality	lnRGDP_SA is dependent

The causality results imply that the following regressions can be estimated.

$$\ln GDP_{mines} = f(\ln FDI, \ln productivity, \ln mine_wage) \dots\dots(A)$$

$$\ln rgdp_sa = f(\ln mine, \ln FDI, \ln productivity) \dots\dots(B)$$

$$\ln FDI = f(\ln mine_wage, \ln exchrte, \ln GDP_{mines}) \dots\dots(C)$$

$$\ln productivity = f(\ln FDI, \ln mine_wage) \dots\dots(D)$$

$$\ln rgdppc_sa = f(\ln FDI, \ln mine_wage, \ln mine_wage) \dots\dots (E)$$

Generally the estimation equation will be of the form:



$$Y_t = \ln\beta_0 + \ln\beta_1 X_{1t} + \ln\beta_2 X_{2t} + \dots + \ln\beta_k X_{kt} + u_t \quad t = 1, 2, 3, \dots$$

Y_t represents the dependent variable

$X_{1t}, X_{2t}, \dots, X_{kt}$ represent all the independent (Exogenous) variables that determine Y in time t .

The last term u_t (disturbance term) represents all other factors that also have some effect on the dependent variable which are not represented herein. The study therefore attempts to use a model that is simplicity in nature but one that is also robust enough to provide an ideal scientific result.

4.4 Time profiles of the key variables

The time profiles of the key variables are represented by the graphs depicting the movement of the variables over time. Below follows an example of the time profiles and the graphs for each of the respective variables.

Log of Foreign Direct Investment (lnFDI)

From the graph below representing the time profile of FDI it is noted that the series remained almost constant for two (2) years from 2003 to the fourth quarter of 2004. It is observed that there was a slump in FDI in 2005 before it increased in later years.

Log of labour productivity (lnlproductivity)

Labour productivity in the mining sector (as represented by the index) showed consistent decline from 2006 to 2013 in South Africa. This may have been caused by endless unrest in the mining sector which saw many job stoppages and strikes.

Log of unit labour cost (lnunitLcost)

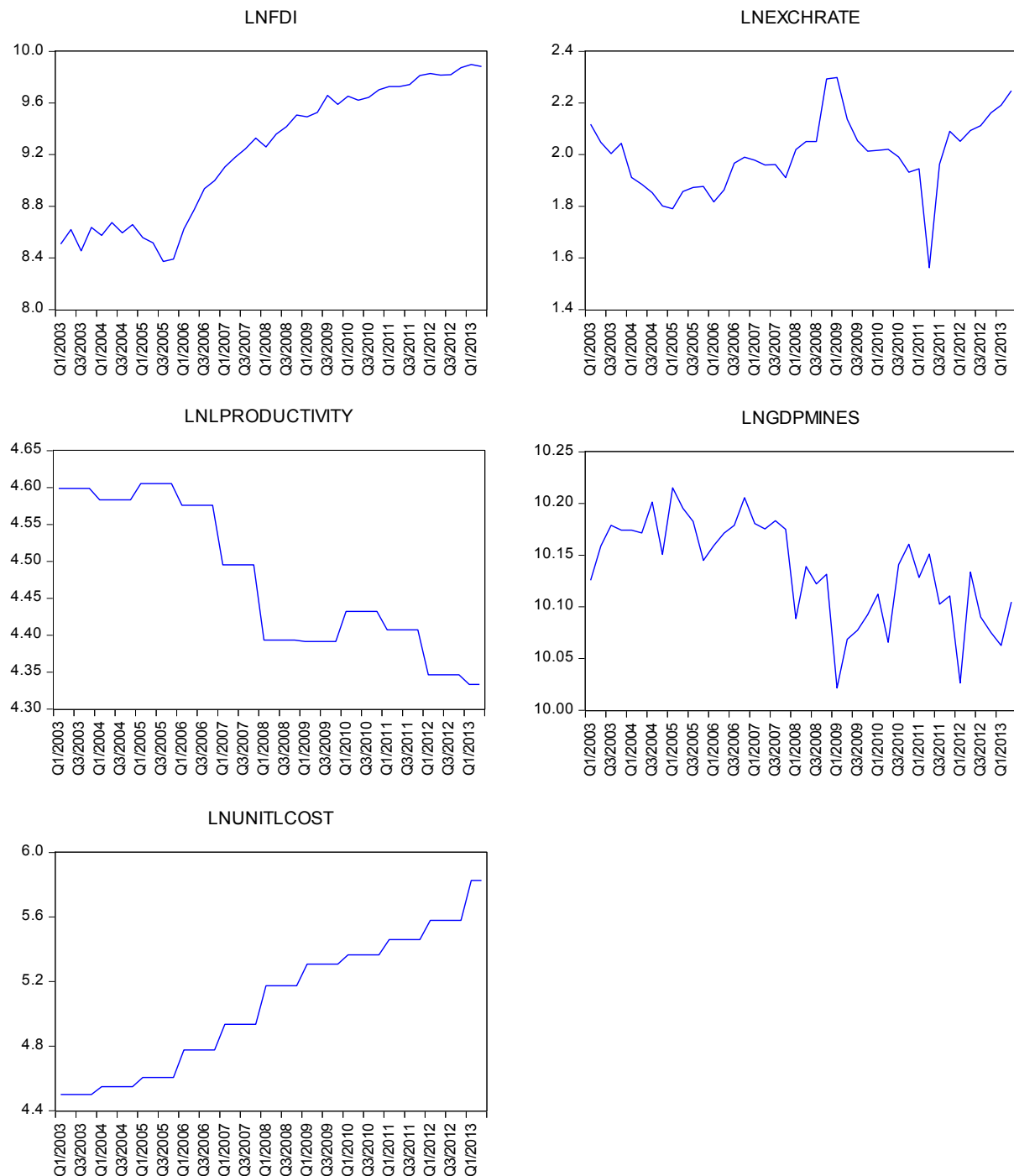
The unit labour cost is captured as an index of labour costs over the years. Since 2003 there has been a consistent increase in the cost of labour in the mining sector. This graph corroborates the decline in productivity depiction.

Log of Gross Domestic Product in mining sector (lnGDPmines)

A clear pattern shows declining GDP in the mining sector over time. The movement of mining production is opposite to the movement in exchange rate. This could be the case if the



mining sector uses a lot of intermediate goods that are imported. The loss of value of the local currency (shown by an upward spike in 2009) makes imported intermediate technology expensive leading to a decline in production (see a downward spike in the logarithm of GDP in mines in 2009).



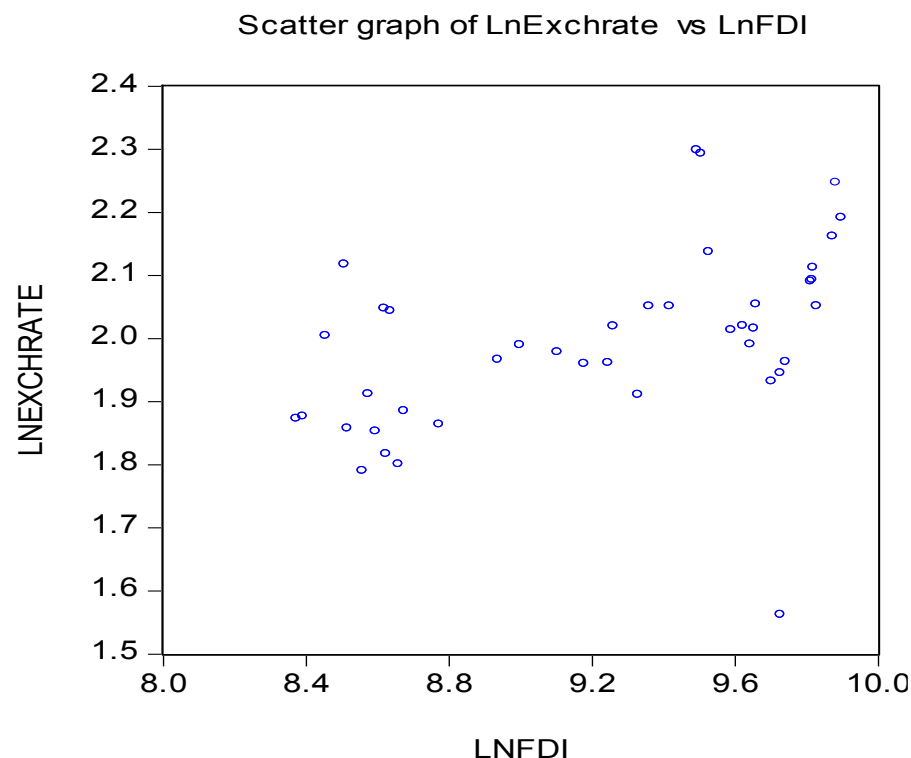
4.5 Correlation coefficients

It is trite that correlation does not suggest causality. The correlation coefficients however are essentially important for purposes of identifying the linear relationship between variables. The table below highlights the correlation coefficients of the variables.

	LNFDI	LNLPRODUCTIVITY	LNEXCHRATE	LNUNITLCOST	
LNFDI	1.000000	-0.954735	0.454253	0.969788	
LNLPRODUCTIVITY	-0.954735	1.000000	-0.542049	-0.960178	
LNEXCHRATE	0.454253	-0.542049	1.000000	0.456851	
LNUNITLCOST	0.969788	-0.960178	0.456851	1.000000	

LnExchrte vs LnFDI

From the table it is clear that LnFDI is positively related to LnExchrte but not in a significant way as the coefficient of correlation is only 0.4542. This means that FDI increases whenever there has been a depreciation of the rand. This is represented in the graph below.



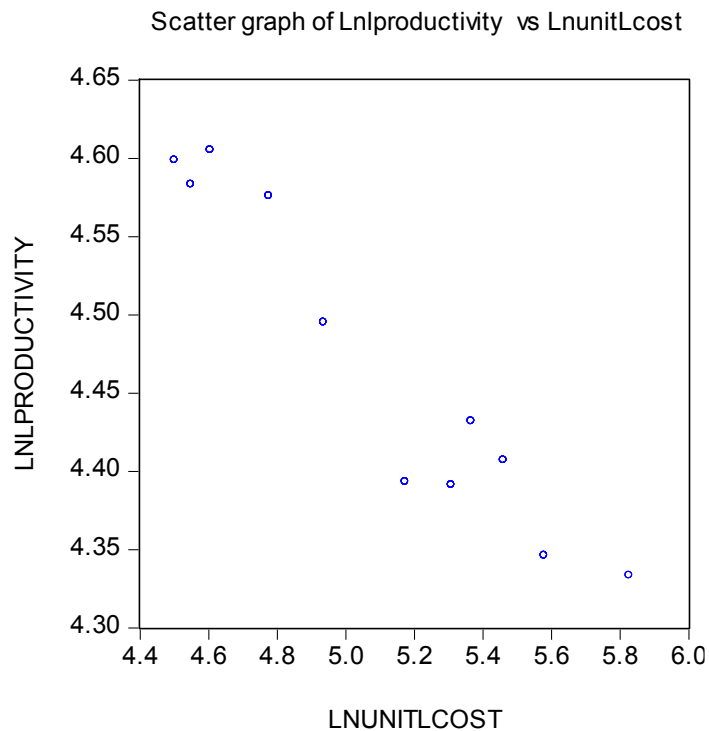
The graph above clearly shows a positive association between FDI and Exchange rate notwithstanding the few outliers identified in the graph.



Lnproductivity vs LnunitLcost

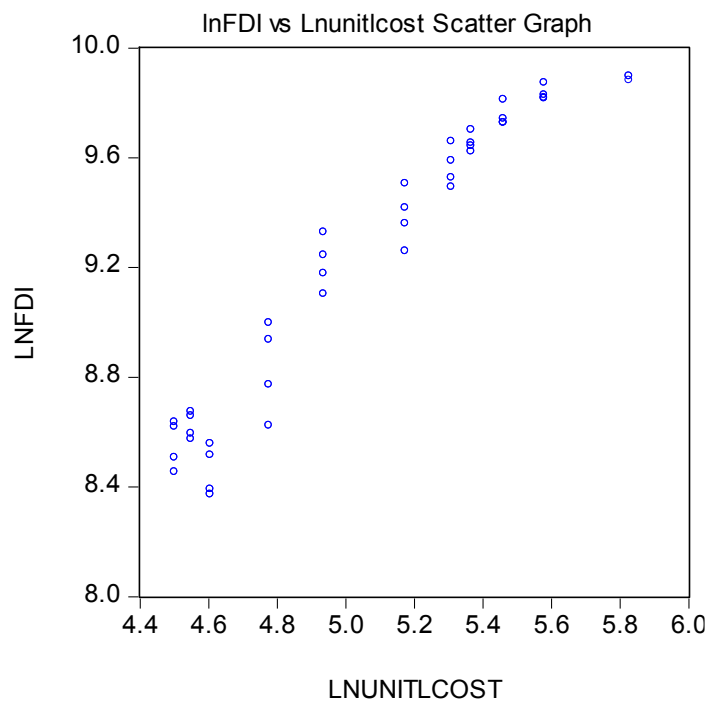
The negative correlation between productivity and unit labour cost is expected. An increase in labour productivity implies a decrease in labour costs.





The scatter graph tells us that reducing unit labour cost in the mining sector causes productivity to rise. This has very strong and positive implications for policy in order to improve productivity and hence total output in the mining sector.

LnFDI vs Lnunitlcost



The positive relationship between $\ln FDI$ and $\ln unitcost$ as shown by the scatter graph above is surprising as one would have expected that FDI in mining decreases when the mining unit labour cost increases. This calls for further analysis of the relationship between these variables. The analysis is undertaken in the summary of the findings below.

4.6 Unit Root Tests

Unit root testing for $\ln productivity$

Null Hypothesis: $D(LNLPRODUCTIVITY)$ has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.658070	0.0000
Test critical values: 1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Comment:

The variable $\ln productivity$ is stationary only when differenced once and therefore it is $I(1)$.

Unit root testing for $\ln Exchrte$

Null Hypothesis: $D(LNEXCHRATE)$ has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.375531	0.0000
Test critical values: 1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Comment:

The variable $\ln exchrte$ is stationary only when differenced once and therefore it is $I(1)$.



Unit root testing for LnFDI

Null Hypothesis: D(LNFDI) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.971949	0.0000
Test critical values: 1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Comment:

The variable lnFDI is stationary only when differenced once and therefore it is $I(1)$.

Unit root Testing for lnunitlcost

Null Hypothesis: D(LNUNITLCOST) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 3 (Automatic - based on SIC, maxlag=9)

	t-Statistic
Elliott-Rothenberg-Stock DF-GLS test statistic	-1.523029
Test critical values: 1% level	-3.770000
5% level	-3.190000
10% level	-2.890000

*Elliott-Rothenberg-Stock (1996, Table 1)

Warning: Test critical values calculated for 50 observations
and may not be accurate for a sample size of 37

Comment:

The variable lnunitlcost is not stationary even when differenced once.

Conclusion:

The variables $\ln lproductivity$, $\ln exchrates$ and $\ln FDI$ are all $I(1)$. In this regard therefore what follows is a test for cointegration among the variables using the Johansen Cointegration Procedure.

4.7 Cointegration Tests

Testing for cointegration among the $I(1)$ variables

Date: 12/09/13 Time: 20:05

Sample (adjusted): 3 42

Included observations: 40 after adjustments

Trend assumption: Linear deterministic trend

Series: LNFDI LNXCHRATE LNLPRODUCTIVITY

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.390560	25.03482	29.79707	0.1602
At most 1	0.118323	5.226246	15.49471	0.7843
At most 2	0.004715	0.189047	3.841466	0.6637

Trace test indicates no cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The outcome of the Johansen Cointegration procedure shows that the $I(1)$ variables are not cointegrated and therefore there are no long-run relationships among them. We therefore need not estimate an ECM. A normal multi-regression will suffice for our purpose.

4.8 Regression Results

The study examines a number of regression equations to capture the quantitative impact of independent variables on selected dependent variables for policy purposes.

Regression 1

$$\ln FDI = f(\ln exchrates, \ln lproductivity) \dots (1) \quad (\text{altered equation})$$

Dependent Variable: LNFDI



Variable	Coefficient	Standard error	t-Statistic	Prob.
C	10.95634	3.484549	3.144264	0.0033
LNLPRODUCTIVITY	-0.018201	0.583332	-0.031202	0.9753
LNEXCHRATE	0.059088	0.125679	0.470146	0.6410
AR(1)	0.981398	0.027232	36.03862	0.0000
$R^2 = 0.9736$, $\text{adj}R^2 = 0.9714$ F-statistic = 454.46, prob (F statistic) = 0.00000 Durbin- Watson Statistic = 2.186 Number of Observations = 42				

Estimated Equation:

$$\text{LNFDI} = 10.956 - 0.0182 \cdot \text{LNLPRODUCTIVITY} + 0.0591 \cdot \text{LNEXCHRATE} + [\text{AR}(1)=0.981398200692] \dots (3.1)$$

Regression Interpretation

The estimated equation depicts that if productivity was to increase by 1% then FDI would be reduced by 0.0182%. Both the t-statistic (> 2) and the probability value which are more than 5% highlight the fact that this variable is insignificant to explain FDI.

Similarly, it is evident that if the Rand depreciated by 1% then FDI would increase by 0.0591%. This then means that the exchange rate variable is not significant in determining FDI as shown by the probability value. An autoregressive term AR(1) is included in the regression estimation to ensure correction of autocorrelation in the residuals and that the regression results are evocative and reliable.

Regression 2

$$\ln \text{GDP}_{\text{mines}} = f(\ln \text{FDI}, \ln \text{productivity}, \ln \text{mine_wage}) \dots (2)$$

Dependent Variable: LNGDPMINES



Variable	Coefficient	Standard error	t-Statistic	Prob.
C	7.013371	1.030047	6.808787	0.0000
LNLPRODUCTIVITY	0.577531	0.149128	3.872709	0.0004
LNMINE_WAGE	0.055796	0.039005	1.430486	0.1605
$R^2 = 0.611940$, $\text{adj}R^2 = 0.592039$ F-statistic = 30.74991, prob (F statistic) = 0.00000 Durbin- Watson Statistic = 1.561152 Number of Observations = 42				

Estimated equation:

$$\text{LNGDPMINES} = 7.013 + 0.578 \cdot \text{LNLPRODUCTIVITY} + 0.0558 \cdot \text{LN MINE_WAGE}$$

Interpretation of results

The results depict that an increase in productivity by 1% would mean an increase in output in the mining sector by 0.578%. Additionally, an increase in wages in the mining sector by 1% increases the output by 0.0558%. Productivity is a significant factor of output in the mining industry in South Africa. Though wages have an expected impact in the regression model the results achieved depict that it is not significant as the p-value is greater than 5%.

A test for presence of auto-correlated residuals was carried out and the results are shown in the table below.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.704328	Prob. F(2,37)	0.5009
Obs*R-squared	1.540371	Prob. Chi-Square(2)	0.4629



The null hypothesis is that residuals from the estimated equation are not correlated. Since the probability values of both F statistic and the Chi Square are more than 5% the null hypothesis is accepted that there is no serial correlation in the residuals. This then means that we can rely on the results from the regression above.

Regression number 3

$$\ln r_{gdp_sa} = f(\ln mine, \ln FDI, \ln productivity) \dots \dots \dots (3)$$

Dependent Variable: LNRGDP_SA

Variable	Coefficient	Standard error	t-Statistic	Prob.
C	-155.0951	107421.5	-0.001444	0.9989
LN MINE_WAGE	0.239769	0.081202	2.952730	0.0055
LN FDI	0.029123	0.033886	0.859437	0.3958
LN LPRODUCTIVITY	0.604499	0.122107	4.950548	0.0000
AR(1)	0.999961	0.025471	39.25916	0.0000

$R^2 = 0.948447$, $\text{adj}R^2 = 0.942719$

F-statistic = 165.5789, prob (F statistic) = 0.00000

Durbin- Watson Statistic = 2.021410 Number of Observations = 41 after adjustments for AR(1)

Estimated equation:

$$\text{LNRGDP_SA} = -155.095 + 0.240 * \text{LN MINE_WAGE} + 0.029 * \text{LN FDI} + 0.604 * \text{LN LPRODUCTIVITY} + [\text{AR}(1) = 0.999960947723]$$

Interpretation of results

After correcting for serial correlation the above results were obtained. The results reveal that the response of real GDP in South Africa as a result of increasing mining wages by 1% is an increase of 0.240%. If the FDI is increased by 1% then real GDP increases by 0.029%.



Finally productivity increase of 1% leads to an increase in real GDP of 0.6%. In this regression wage and productivity are significant as factors of real GDP for South Africa.

Regression results of lnFDI on lnunitlcost and lnexchrte

Dependent Variable: LNFDI

Variable	Coefficient	Standard error	t-Statistic	Prob.
C	10.69830	3.221098	3.321319	0.0020
Lnunitlcost	0.019063	0.208800	0.091297	0.9277
Lnexchrte	0.059137	0.125645	0.470666	0.6406
AR(1)	0.980816	0.028012	35.01353	0.0000
$R^2 = 0.973584$, $\text{adj}R^2 = 0.971442$ F-statistic = 454.55, prob (F statistic) = 0.00000 Durbin- Watson Statistic = 2.188666 Number of Observations = 41 after adjustments for AR(1)				

As was the case with the correlation between FDI and Unit labour cost, the regression results show that FDI and Unit labour cost are positively related. However, the relationship is not significant as the probability value of the coefficient is much less than five percent (5%).

One would assume that the expected result would be that of a negative relationship between FDI and unit labour costs. From the literature review there is a clear bias in the study on the relationship between FDI and unit labour cost. What was assumed was that there would be a clear negative relationship between the two variables. The risk that is run in this regard is that the study could be criticised for endogeneity.

The foregoing may not be accurate. What the results depict is the fact that investment in the mining industry is not necessarily affected by the rise in the unit labour costs. This could be so for a number of reasons. These are discussed below in the summary of the findings.



4.9 Summary of data analysis

Results from the data analysis carried out above highlight outcomes on the one hand that would be expected as a matter of course and on the other hand that are surprising. It is noted that FDI is positively related to the exchange rate in the sense that when the rate of the rand to the dollar depreciates there is an increase in the inflow of FDI. However it is noted that the relationship is not significant. This then begs the question whether the liberalisation of controls, that is, allowing the rand to be determined by market forces has been beneficial to the country in attracting FDI. It would seem that given the insignificance of the relationship the relaxation of the controls has not been necessarily an ideal strategy for South Africa. This could be attributed to the fact the rand has fluctuated over time making the risk profile of the country unfavourable.

As alluded to earlier the negative relationship between productivity and the unit labour cost is expected. An increase in labour productivity implies that there is a decrease in labour costs. As illustrated in the literature review companies more specifically in the mining industry have endeavoured to invest in technology to increase the output of their mines and as a result increase productivity. What this translates to is a decrease in the input which essentially equates to a decrease in the labour costs.

A substantially insignificant result is observed in respect of the relationship between productivity and FDI. It is noted that there is a negative relationship between the variables, in this case, where productivity increases by 1% FDI reduces however the reduction is not significant.

An increase in wages in the mining sector is said to have the effect of an increase in the output. The assumption that is made here is that an increase in wages could be equated to the increase in the number of skilled labour that earn higher wages and who are knowledgeable in the application of technology that bring about increased output.

A result that highlights a significant relationship is the one in respect of the relationship between wages and real GDP as well as productivity and real GDP. The results show that wages and productivity are significant factors in respect of the country real GDP as they have a positive relationship.

Lastly a surprising result is that observed in respect of the relationship between FDI and unit labour costs. As stated earlier there is a positive relationship between FDI and Unit

labour cost. However, the relationship is not significant as the probability value of the coefficient is much less than five percent (5%).

One would assume that the expected result would be that of a negative relationship between FDI and unit labour costs. It is noted that there could be a number of reasons why this is the case.

South Africa has an abundance of natural resources such as gold, platinum, coal, iron ore and diamonds that contribute toward the high share of mining products and natural resource-intensive manufactures in total South African exports (Edwards and Golub, 2004). But, changes in commodity prices, particularly gold and platinum prices, trade policies and other macroeconomic variables are likely to affect the exchange rate, and therefore unit labour costs (Edwards and Golub, 2004). In this regard therefore it would not be surprising to see a positive relationship with FDI as the increase in the unit labour costs are a consequence of the currency fluctuation and not the actual input.

Additionally it can be argued that the increase in skilled labour over a period of time in South Africa following the end of the apartheid era has contributed to the increase in the unit labour costs as real wages of skilled mine workers are relatively high compared to those of the unskilled mine workers. This does not however deter FDI in the sense that the capacity of human capital in a country is actually an attractive factor to investors who require skilled workers to run their mines.

Paragraphs below provide a discussion on the policy implications on the results summarised herein.

4.10 Policy Implications of the regression results and recommendations

Results arising from the data analysis undertaken above highlight important issues that should be taken cognisance of in the formulation of economic policy in South Africa. As alluded to in the introduction the study aims to investigate whether the liberalisation of capital controls in the mining industry in South Africa has had a direct influence in the inflow of FDI. The rationale for the specific focus of the mining industry stems from the fact that mining in South Africa contributes significantly to the economy of South Africa and therefore presents an ideal case study for this research.

As highlighted in the literature review, there are no longer any general restrictions on the inflows and outflows of foreign capital under exchange controls. Similarly as stated by the South Africa National Treasury, since October 2009, local borrowing for the purpose of genuine FDI may be undertaken without restriction unlike previously where it was limited to 300 percent of foreign capital (National Treasury, 2011).

These are some of the measures put in place by the South Africa government in the liberalisation of capital controls to attract FDI. What comes to the fore from the empirical analysis is that these have not really had a significant influence in the attraction of FDI. The study provides an analysis of the exchange rate of the rand to the dollar against the inflow of FDI. Exchange rate here is equated as a measure for capital controls in the following respects. The non-restriction of the inflow and outflow of capital in the country means that there is no control of other currencies in the country, in this case, the dollar. This then brings about a change in the reserve volumes of the currencies and influences the rate at which the rand trades with other currencies. The results of the empirical analysis highlight that although the relationship between the exchange rate and FDI is positive, the relationship is not significant.

The results achieved highlight the fact that policy makers need to consider seriously other underlying factors that affect the inflow of FDI significantly and consider whether restrictions lifted with the aim of attracting FDI should not be reconsidered in the face of the volatile rand that has brought about an unstable economy.

It is important to reiterate the sentiments of various authors who argue that the liberalisation of exchange controls has not really played a significant in the attraction of FDI. Mohamed Seeraj (2006) in an examination of the period up to 2002, argues that the surge in portfolio capital flows to South Africa and the related increased extension of credit to the private sector during the 1990s was not associated with increased levels of fixed investment, but with increased household consumption, financial speculation and capital flight. In the same breath, Dr. Ingrid Angermann (2005) notes that the liberalisation of foreign exchange restrictions in South Africa (with specific reference to the mining industry) promotes the flight of capital due to the diversification of companies. Dr. Angermann states that this is particularly relevant at present, as the prices of precious metals have accelerated rapidly. However, he also states that the simultaneous surge of the Rand has largely eroded the associated profits.

The study therefore considers other factors in trying to uncover why South Africa has not enjoyed a great increase in the inflow of FDI. An analysis is undertaken in respect of the

effect of unit labour costs on FDI. It is noted that unit labour costs in the mining industry have been on an incremental trajectory. What was surprising was the fact that the increase in the unit labour costs does not necessarily deter the inflow of FDI which is the opposite of what would be expected. From the results of the study there is a positive relationship, though not significant, between FDI and unit labour costs. Reasons have been levelled as to why this would be the case.

The presumption is that at present unlike other countries in the world unit labour costs are not a deterrent of FDI in South Africa. This then begs the question what factors should policy makers' focus on to redefine the inflow of FDI.

It would seem that South Africa is part of the much conventional development thinking that believe a rapid pace of opening up is the key to attracting the right type of FDI on the desired scale (UNCTAD, 2005). The rationale that is given is that of Africa's low level of FDI is explained by various "governance failures" that have closed the region off to a new growth dynamic built around participation in international production networks and more efficient services activities (UNCTAD, 2005). Suffice to note problems of policy credibility have been identified as likely deterrents to potential foreign investors, with trade policies singled out for particular attention in cross-country regression studies, excessive levels of corruption, regulation and political risk are believed to have further raised costs, adding to an unattractive "business climate" for FDI (UNCTAD, 2005).

The South African National Treasury highlights the fact that the development of a review framework should be sensitive to the administrative burden implied by the range of existing regulations on foreign entry, ownership and operations (National Treasury, 2011). It notes that there are a number of public interests considerations that should be considered which include a diverse range of economic and social issues regarding the ownership of firms and the private versus social returns to investment.

In summary what this study brings to the fore is the fact that the rapid opening up of the South African market by the liberalisation of capital controls is ill informed. The resulting effect is the volatile of the rand and the instability of the economy.

Therefore policy makers should focus more on other factors such as the defining regulations that provide incentives for foreign entry, do not adversely burden the ownership of mines and

are not burdensome to the operations of the mines. These however have to be undertaken in the context of the protection of the local investors.

In addition a great deal of investment should be spent towards the enhancement of the human capital and technology in the country. It is clear that there is a positive link between real GDP and high levels of productivity which is brought about from efficiency in the input and the output derived. Even though results in respect of the regression analysis between FDI and productivity show an insignificant negative relationship, it is believed that the net return on FDI can be positive over time if the country invests in human capital and technology.



CHAPTER FIVE

5.1 Research Conclusion

South Africa possesses an abundance of minerals which have played a significant role in the shaping of the economy. The focus of the study was therefore identified bearing in mind the significance of the mining industry and the corresponding impact that the industry has in influencing policy formulation for economic development.

In recent years the mining industry in South Africa has been marred by countless labour strikes and the falling prices of commodities. This has had the effect of the flight of foreign investors in other countries that have portrayed a less volatile business environment.

In an effort to attract FDI the South African government has implemented various policies that are deemed ideal for this purpose. Capital controls have been liberalised at a fast rate in the guise of opening up South Africa to investors. In contrast however the government still maintains various regulations in respect of foreign entry restrictions, that is, the licensing of foreign companies in respect of the extraction of minerals, ownership and operations.

The study has portrayed that the focus of the government on liberalisation is ill informed as the effect of this policy has not achieved the desired outcome which is the attraction of high levels of FDI. Instead the policy has resulted in a rand that is very volatile which in itself can be said to be a deterrent to foreign investors who question the poor formulation of policies.

What is advised is a refocus on issues that are critical to the policy formulation of the country based on the findings of the study. Firstly is it advised that the government should look into issues around regulation on foreign entry restrictions, ownership and mining operations. This should however be undertaken in the context of what benefits the government seeks to derive from FDI and the protection of local investors.

Additionally, investment in human capital and technology is seen as an important aspect for the attraction of FDI. The attraction to the country is enhanced where the output produced requires minimal input given the efficiency of the human capital and technology.

Given the abundant reserves of minerals that South Africa holds and the good infrastructure that it possesses the country remains a great attraction for FDI. The government should therefore endeavour to implement policies that create a level of openness to the business

environment that allows the right formulation of FDI and not one that erodes the value of the rand resulting in the instability of the economy.



CHAPTER SIX

6.1 Further Research Directions

The study has portrayed the need to enhance human capital capacity and technology as seen in respect of the positive relationship between productivity and real GDP equating net returns. In the literature review it comes out clearly that Africa has not attracted FDI due to the lack of skills and technology.

In this regard therefore research on the status of the human capital capacity and the technological advancement in South Africa in the mining industry is deemed critical. This should be linked to the study of how the current status has influenced the attraction of FDI and how best this can be improved, for instance, creating an enabling environment for the registration patent rights and investing in skills enhancement.



References

1. A. H. Suliman & A. V. Mollick (2009), Human Capital Development, War and Foreign Direct Investment in Sub-Saharan Africa, Oxford Development Studies, Vol. 37, No. 1.
2. Andrew J. Abbott, Glauco De Vita, (2011), "Evidence on the impact of exchange rate regimes on bilateral FDI flows", Journal of Economic Studies, Vol. 38 Iss: 3 pp. 253 – 274.
3. Anthony Kyereboah-Coleman, Kwame F. Agyire-Tettey, (2008), "Effect of exchange-rate volatility on foreign direct investment in Sub-Saharan Africa: The case of Ghana", The Journal of Risk Finance, Vol. 9 Iss: 1 pp. 52 – 70.
4. Anyanwu John C. (2012), Why Does Foreign Direct Investment Go Where It Goes?: New Evidence From African Countries, Annals of Economics and Finance 13 -2.
5. Asiedu Elizabeth (2002), On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa different? World Development Vol. 30, No. 1.
6. Asiedu Elizabeth, Lien Donald (2004), Capital Controls and Foreign Direct Investment, World Development Vol. 32 No. 3 pp 479 – 490.
7. Bellak Christian, Leibrecht Markus and Riedl Aleksandra (2008), Labour costs and FDI flows into Central and Eastern European Countries: A survey of the literature and empirical evidence, Structural Change and Economic Dynamic 19, 17 – 37.
8. Bo Sjö, (2008), Testing for Unit Roots and Cointegration. Accessed on <http://www.iei.liu.se/nek/ekonometrisk-teori-7-5-hp-730a70/labbar/1.233753/dfdistrib7b.pdf>
9. Boudier-Bensebaa, F. (2005), Agglomeration economies and location choice: foreign direct investment in Hungary, Economics of Transition 13, 605–628.
10. Braconier Henrik, Norback Pehr-Johan, Urban Dieter (2005), Multinational Enterprises and Wage Costs: Vertical FDI revisited, Journal of International Economics 67.
11. Chamber of Mines South Africa (2013), Annual Report for the 2012-2013 Financial Year. Accessed on www.bullion.org.za.
12. Chanda Areendam (2005), The influence of capital controls on long run growth: Where and how much? Journal of Development Economics 77, 441-466.
13. Chowdhury Abdur and Wheeler Mark (2008), Does Real Exchange Rate Volatility Affect Foreign Direct Investment? Evidence from four developed economies, International Trade Journal, Vol. 22, No. 2.

14. Chou Kuang-Hann, Chen Chein-Hsun and Mai Chao-Cheng (2011), The impact of third-country effects and economic integration on China's outward FDI, *Economic Modelling* 28.
15. Cordella Tito, (2003), Can short-term capital controls promote capital inflows? *Journal of International Money and Finance* 22, 737-745.
16. CUTS (2003), Investment Policy in South Africa – Performance and Perceptions.
17. Department of Labour (2011), Strike activity as measured in the number of work stoppages, working days lost, time loss ratio, working hours lost and wages lost, 2007 – 2011, accessed on http://www.labour.gov.za/DOL/downloads/documents/annual-reports/industrial-action-annual-report/2011/industrialreport2012_part2.pdf.
18. Defever, F. (2006), Functional fragmentation and the location of multinational firms in the enlarged Europe, *Regional Science and Urban Economics* 36, 658–677.
19. Dick K. Nanto at el. (2009), The Global Financial Crisis: Analysis and Policy Implications, Congressional Research Service, accessed on <http://assets.opencrs.com/>.
20. Dr. Ingrid Angermann (2006), End of foreign exchange restrictions in South Africa – is everything hunky-dory? Economic Research, Allianz Group Dresdner Bank Working Paper.
21. Edwards, S. (1990), Capital flows, foreign direct investment, and debt-equity swaps in developing countries. NBER Working Paper No. 3497, NBER, Cambridge, M.A.
22. Eicher Theo S., Helfman Lindy and Lenkoski Alex (2012), Robust FDI determinants: Bayesian Model Averaging in the presence of selection bias, *Journal of Macroeconomics* 24, 637 – 651.
23. Faisal Ahmed, Rabah Arezki and Norbert Funke (2005), The Composition of Capital Flows: Is South Africa Different? International Monetary Fund.
24. Farhad Noorbakhsh, Alberto Paloni and Ali Youssef (2001), Human Capital and FDI Inflows to Developing Countries: New Empirical Evidence, *World Development*, Vol. 29, No. 9, pp 1 593 – 1610.
25. Farrell, G. N. (2001), Capital Controls and the Volatility of South African Exchange Rates, South African Reserve Bank Occasional Paper No 15.
26. Fedderke J. W. and Romm A. T. (2006), Growth impact and determinants of foreign direct investment into South Africa, 1956 – 2003, *Economic Modelling* 23, 738 – 760.
27. G Clarke, J Habyarimana, D Kaplan & V Ramachandram (2008), Why isn't South Africa growing faster? Microeconomic evidence from a firm survey, *Journal of International Development* 20, 837 – 868.



28. Glick Reuven, Hutchison Michael (2005), Capital Controls and Exchange Rate instability in developing economies, *Journal of International Money and Finance* 24, 387-412.
29. Glick Reuven, Hutchison Michael (2011), The illusive quest: Do international capital controls contribute to currency stability? *International Review of Economics and Finance* 20, 59-70.
30. Goldberg, J., (2011), Strike Action in South Africa.
31. H. P. Janicki and P. V. Wunnava (2004), Determinants of foreign direct investment: empirical evidence from EU accession candidates, Taylor & Francis, *Applied Economics*, 36, 505 – 509.
32. John M. Luiz and Meshal Ruplal (2010), Foreign Direct Investment and the Internationalisation of South African mining companies into Africa, Working Paper Number 194.
33. Jonathan D. Ostry, Atish R. Ghosh, Karl Habermeier, Marcos Chamon, Mahvash S. Qureshi, and Dennis B. S. Reinhardt (2010), Capital Inflows: The Role of Controls, International Monetary Fund.
34. Jose De Gregorio, Sebastian Edwards, Rodrigo O. Valdes, (2000), Controls on capital inflows: do they work? *Journal of Development Economics*, Vol. 63, 59-83.
35. Karl Habermeier, Annamaria Kokenyne and Chikako Baba (2011), The Effectiveness of Capital Controls and Prudential Policies in Managing Large Inflows, International Monetary Fund.
36. Kastner Scott L., Rector Chad, (2003), International Regimes, Domestic Veto-Players, and Capital Controls Policy Stability, *International Studies Quarterly*, Wiley-Blackwell, Vol. 47, 1-22.
37. Keller Gerald (2009), *Management Statistics*, Eighth Edition, South Western Cengage Learning pp 822.
38. Leon Peter (2012), Whither the South African Mining Industry? *Journal of Energy and Natural Resources Law*, Vol 30 No.1.
39. Lim Ewe-Ghee (2001), Determinants of, and the Relation Between, Foreign Direct Investment and Growth: A summary of the Recent Literature, IMF Working Paper.
40. Murgasova, Z. (2005), Post-transition investment behavior in Poland: a sectoral panel analysis, International Monetary Fund: 184, Washington.
41. National Treasury (2011), A review framework for cross-border direct investment in South Africa. Accessed on



<http://www.treasury.gov.za/documents/national%20budget/2011/A%20review%20framework%20for%20crossborder%20direct%20investment%20in%20South%20Africa>.

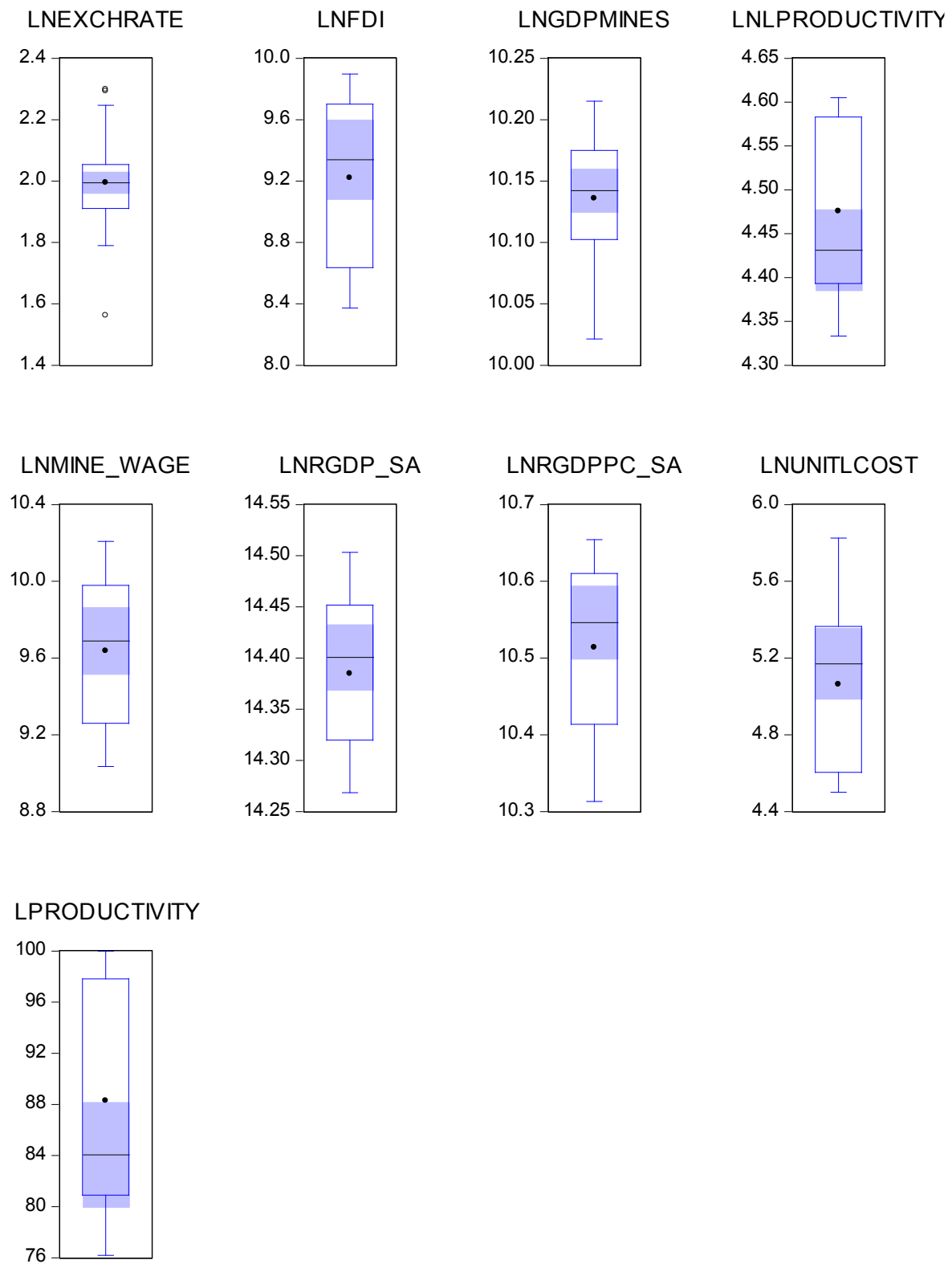
42. National Treasury (2011), The Medium Term Budget Policy Statement. Assessed on <http://www.treasury.gov.za/documents/mtbps/2011/default.aspx>.
43. Neely Christopher J. (1999), An Introduction to Capital Controls, St. Louis Federal Reserve Bank, accessed on <https://research.stlouisfed.org/publications>.
44. Neumann Rebecca M. (2006), The effects of capital controls on international capital flows in the presence of asymmetric information, *Journal of International Money and Finance* 25, 1010-1027.
45. Orlov Alexei G. (2005), Pros and Cons of Capital Controls in the Presence of Incomplete Markets, *The American Economist* Vol. 49 No.1, 79-93.
46. Palma, G. (2000), Three Routes to Financial Crises: The Need for Capital Controls, Working Paper, Center for Economic Policy Analysis, New School.
47. Padraig Carmody, Between Globalisation and (Post) Apartheid: The Political Economy of Restructuring in South Africa, *Journal of Southern African Studies*, Taylor & Francis, Vol 28. No. 2 (June 2002) pp 255-275.
48. Rex Mckenzie and Nicolas Pons-Vignon (2012), Volatile Capital Flows and a Route to Financial Crisis in South Africa, MPRA Paper No. 40119 accessed at <http://mpra.ub.uni-muenchen.de/40119/>.
49. Reinhart Carmen M., Smith R. Todd (2002), Temporary controls on capital inflows, *Journal of International Economics* 57, 327-351.
50. Rodney Schmidt, (2001), Efficient Capital Controls, *Journal of Economic Studies*, Vol. 28 Iss: 3, 199-212.
51. Root, F., & Ahmed, A, (1979), Empirical determinants of manufacturing direct foreign investment in developing countries, *Economic Development and Cultural Change*, 27, 751-767.
52. Sam Ashman, Ben Fine and Susan Newman (2011), Amnesty International? The Nature, Scale and Impact of Capital Flight from South Africa, *Journal of Southern African Studies*, 37:01, 7 – 25.
53. Schneider, F., and Frey, B. S. (1985), Economic and political determinants of foreign direct investment. *World Development*, 13, 161 - 175.

54. Seeraj Mohamed (2006), The impact of international capital flows on the South Africa economy since the end of apartheid accessed on http://www.networkideas.org/feathm/mar2007/PDF/Seeraj_Mohamed.pdf.
55. Seeraj Mohamed (2009), The Impact of the global economic crisis on the South African economy, United Nations Research Institute for Social Development.
56. Tamirisa Natalia T. (1999), Exchange and Capital Controls as Barriers to Trade, IMF Staff papers, Vol. 46. No.1, Palgrave Macmillan Journals, 69-88.
57. Tsai, P. (1994), Determinants of foreign direct investment and its impact on economic growth, Journal of Economic Development, 19, 137 – 163.
58. UNCTAD (2005), Economic Development in Africa, Rethinking the role of FDI, United Nations Publication, ISBN 92-1-112671-1.
59. UNCTAD. (Ed.). (2006) World Investment Report FDI from Developing Transition Economies: Implications for Development (E.06.II.D.11), New York, United Nations Publication.
60. Walkenhorst, P. (2004), Economic transition and the sectoral patterns of foreign direct investment, Emerging Markets Finance and Trade 40 (2), 5–26.



Appendices

Box Plots for normality and detection of outliers



The box plots show no signs of outliers in the data except for evenly distributed outliers in the *lnexchrte* variable. This further confirms the JB tests of normality that was undertaken earlier.

Pairwise Granger Causality Tests

Date: 11/10/13 Time: 08:42

Sample: 1 42

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LNFDI does not Granger Cause LNEXCHRATE	40	1.77426	0.1845
LNEXCHRATE does not Granger Cause LNFDI		0.02007	0.9801
LNGDPMINES does not Granger Cause LNEXCHRATE	40	1.25035	0.2989
LNEXCHRATE does not Granger Cause LNGDPMINES		1.59895	0.2165
LNLPRODUCTIVITY does not Granger Cause LNEXCHRATE	40	3.20516	0.0527
LNEXCHRATE does not Granger Cause LNLPRODUCTIVITY		0.15347	0.8583
LN_MINE_WAGE does not Granger Cause LNEXCHRATE	40	2.38506	0.1069
LNEXCHRATE does not Granger Cause LN_MINE_WAGE		1.15999	0.3253
LN_RGDP_SA does not Granger Cause LNEXCHRATE	40	0.62133	0.5430
LNEXCHRATE does not Granger Cause LN_RGDP_SA		2.57381	0.0906
LN_UNIT_LCOST does not Granger Cause LNEXCHRATE	40	2.15954	0.1305
LNEXCHRATE does not Granger Cause LN_UNIT_LCOST		0.60692	0.5507
LNGDPMINES does not Granger Cause LNFDI	40	0.08590	0.9179
LNFDI does not Granger Cause LNGDPMINES		3.79229	0.0323
LNLPRODUCTIVITY does not Granger Cause LNFDI	40	0.92122	0.4075
LNFDI does not Granger Cause LNLPRODUCTIVITY		3.87583	0.0302
LN_MINE_WAGE does not Granger Cause LNFDI	40	3.74252	0.0337
LNFDI does not Granger Cause LN_MINE_WAGE		0.15258	0.8591



LNRGDP_SA does not Granger Cause LNFDI	40	1.23291	0.3038
LNFDI does not Granger Cause LNRGDP_SA		5.16535	0.0108
LNUNITLCOST does not Granger Cause LNFDI	40	1.73841	0.1906
LNFDI does not Granger Cause LNUNITLCOST		0.71681	0.4953
LNLPRODUCTIVITY does not Granger Cause			
LNGDPMINES	40	8.32063	0.0011
LNGDPMINES does not Granger Cause LNLPRODUCTIVITY		1.25910	0.2965
LNmine_WAGE does not Granger Cause LNGDPMINES	40	5.83679	0.0065
LNGDPMINES does not Granger Cause LNmine_WAGE		0.19225	0.8260
LNRGDP_SA does not Granger Cause LNGDPMINES	40	0.19698	0.8221
LNGDPMINES does not Granger Cause LNRGDP_SA		1.05064	0.3605
LNUNITLCOST does not Granger Cause LNGDPMINES	40	4.23863	0.0225
LNGDPMINES does not Granger Cause LNUNITLCOST		0.73059	0.4888
LNmine_WAGE does not Granger Cause			
LNLPRODUCTIVITY	40	5.84275	0.0065
LNLPRODUCTIVITY does not Granger Cause LNmine_WAGE		0.04610	0.9550
LNRGDP_SA does not Granger Cause			
LNLPRODUCTIVITY	40	1.85033	0.1722
LNLPRODUCTIVITY does not Granger Cause LNRGDP_SA		4.30964	0.0212
LNUNITLCOST does not Granger Cause			
LNLPRODUCTIVITY	40	1.15305	0.3274
LNLPRODUCTIVITY does not Granger Cause LNUNITLCOST		0.06000	0.9419
LNRGDP_SA does not Granger Cause LNmine_WAGE	40	2.06815	0.1416
LNmine_WAGE does not Granger Cause LNRGDP_SA		5.55903	0.0080
LNUNITLCOST does not Granger Cause LNmine_WAGE	40	5.55164	0.0081
LNmine_WAGE does not Granger Cause LNUNITLCOST		22.4096	5.E-07
LNUNITLCOST does not Granger Cause LNRGDP_SA	40	4.16087	0.0239



LNRGDP_SA does not Granger Cause LNUNITLCOST

1.88421 0.1670

Lag selection Criteria

VAR Lag Order Selection Criteria

Endogenous variables: LNEXCHRATE LNFDI LNGDPMINES LNLPRODUCTIVITY
LNMINE_WAGE LNRGDP_SA LNUNITLCOST LPRODUCTIVITY

Exogenous variables: C

Date: 11/10/13 Time: 09:16

Sample: 1 42

Included observations: 39

Lag	LogL	LR	FPE	AIC	SC	HQ
0	360.5055	NA	1.95e-18	-18.07721	-17.73596	-17.95477
1	604.0288	374.6512*	2.09e-22*	-27.28353	-24.21234*	-26.18161*
2	666.6565	70.65686	3.46e-22	-27.21315	-21.41201	-25.13175
3	745.6606	56.72094	6.51e-22	-27.98260*	-19.45151	-24.92172

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Based on the results of the Schwarz Information criterion two lags are accepted in the analysis.

Full regression results

Dependent Variable: LNFDI

Method: Least Squares

Date: 11/10/13 Time: 17:44

Sample (adjusted): 2 42

Included observations: 41 after adjustments

Convergence achieved after 9 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.95634	3.484549	3.144264	0.0033
LNLPRODUCTIVI				
TY	-0.018201	0.583332	-0.031202	0.9753
LNEXCHRATE	0.059088	0.125679	0.470146	0.6410
AR(1)	0.981398	0.027232	36.03862	0.0000
R-squared	0.973579	Mean dependent var	9.238857	
Adjusted R-squared	0.971436	S.D. dependent var	0.517009	
S.E. of regression	0.087378	Akaike info criterion	-1.944670	
Sum squared resid	0.282494	Schwarz criterion	-1.777492	
Log likelihood	43.86573	Hannan-Quinn criter.	-1.883793	
F-statistic	454.4624	Durbin-Watson stat	2.185789	
Prob(F-statistic)	0.000000			
Inverted AR Roots	.98			

Regression 2

Dependent Variable: LNGDPMINES

Method: Least Squares

Date: 11/10/13 Time: 18:35

Sample: 1 42

Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.013371	1.030047	6.808787	0.0000
LNLPRODUCTIVI				
TY	0.577531	0.149128	3.872709	0.0004



LN_MINE_WAGE	0.055796	0.039005	1.430486	0.1605
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R-squared	0.611940	Mean dependent var	10.13592
Adjusted R-squared	0.592039	S.D. dependent var	0.048593
S.E. of regression	0.031037	Akaike info criterion	-4.038494
Sum squared resid	0.037570	Schwarz criterion	-3.914375
Log likelihood	87.80838	Hannan-Quinn criter.	-3.993000
F-statistic	30.74991	Durbin-Watson stat	1.561152
Prob(F-statistic)	0.000000		

Serial correlation test for regression 2

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.704328	Prob. F(2,37)	0.5009
Obs*R-squared	1.540371	Prob. Chi-Square(2)	0.4629

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 11/10/13 Time: 19:05

Sample: 1 42

Included observations: 42

Pre-sample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.101136	1.043783	-0.096893	0.9233
LNPRODUCTIV				
TY	0.014678	0.151161	0.097103	0.9232
LN_MINE_WAGE	0.003686	0.039491	0.093325	0.9261
RESID(-1)	0.171555	0.165484	1.036687	0.3066
RESID(-2)	0.061778	0.167081	0.369745	0.7137
R-squared	0.036676	Mean dependent var	1.68E-15	



Adjusted R-squared	-0.067468	S.D. dependent var	0.030271
S.E. of regression	0.031275	Akaike info criterion	-3.980621
Sum squared resid	0.036192	Schwarz criterion	-3.773756
Log likelihood	88.59304	Hannan-Quinn criter.	-3.904797
F-statistic	0.352164	Durbin-Watson stat	1.892482
Prob(F-statistic)	0.840841		

Regression number 3

Dependent Variable: LNRGDP_SA

Method: Least Squares

Date: 11/10/13 Time: 19:21

Sample (adjusted): 2 42

Included observations: 41 after adjustments

Convergence achieved after 153 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-155.0951	107421.5	-0.001444	0.9989
LNmine_WAGE	0.239769	0.081202	2.952730	0.0055
LNFDI	0.029123	0.033886	0.859437	0.3958
LNLPRODUCTIVI				
TY	0.604499	0.122107	4.950548	0.0000
AR(1)	0.999961	0.025471	39.25916	0.0000

R-squared	0.948447	Mean dependent var	14.38470
Adjusted R-squared	0.942719	S.D. dependent var	0.075161
S.E. of regression	0.017989	Akaike info criterion	-5.084308
Sum squared resid	0.011649	Schwarz criterion	-4.875336
Log likelihood	109.2283	Hannan-Quinn criter.	-5.008212
F-statistic	165.5789	Durbin-Watson stat	2.021410
Prob(F-statistic)	0.000000		

Inverted AR Roots	1.00
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